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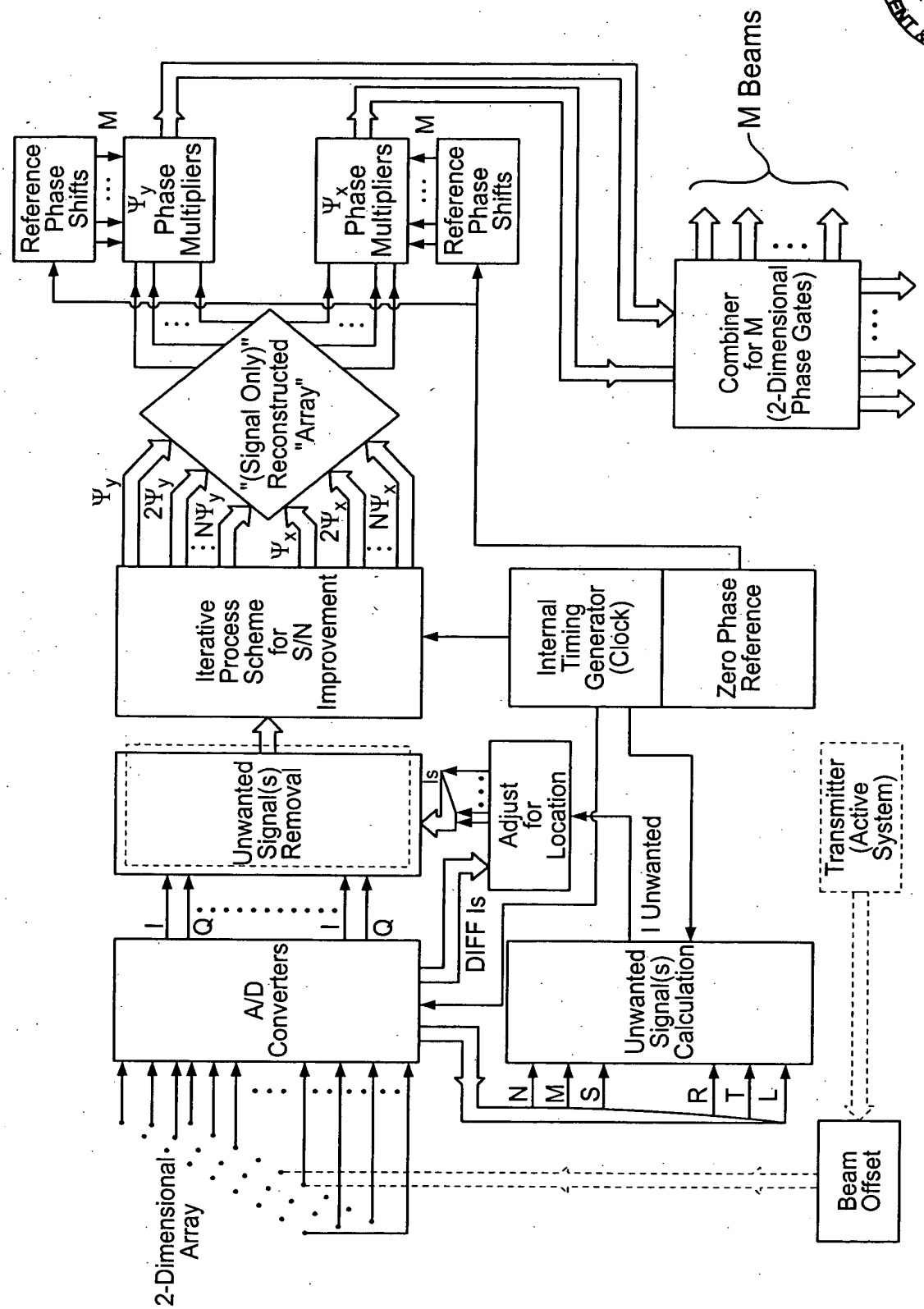

FIG. 1

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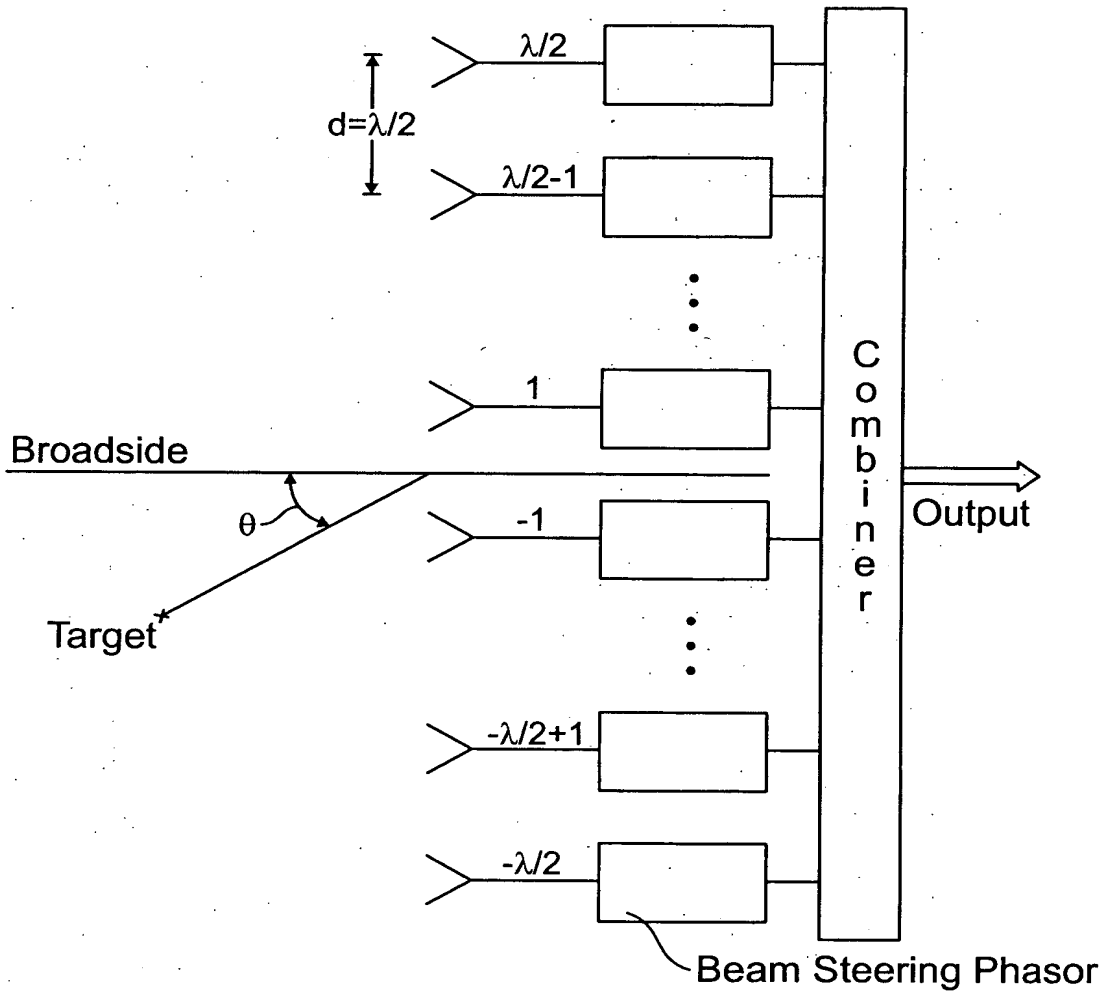

θ=Target Angle Relative to Array Broadside

FIG. 2A

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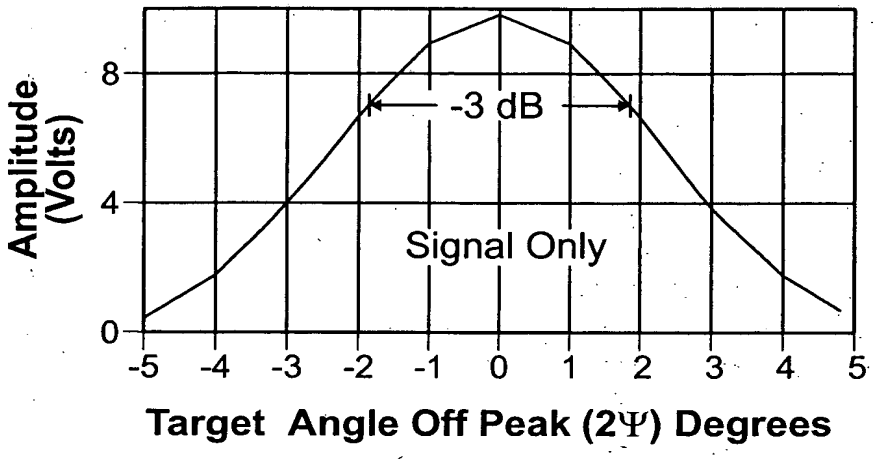

FIG. 2B

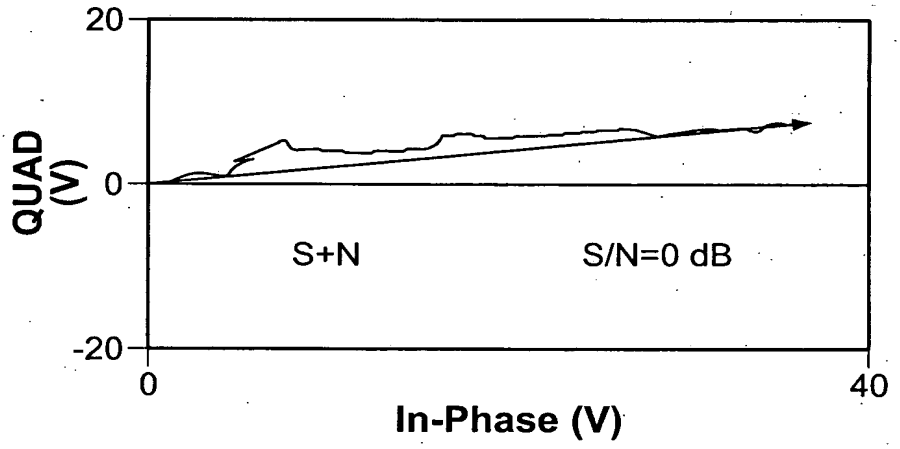

FIG. 3A

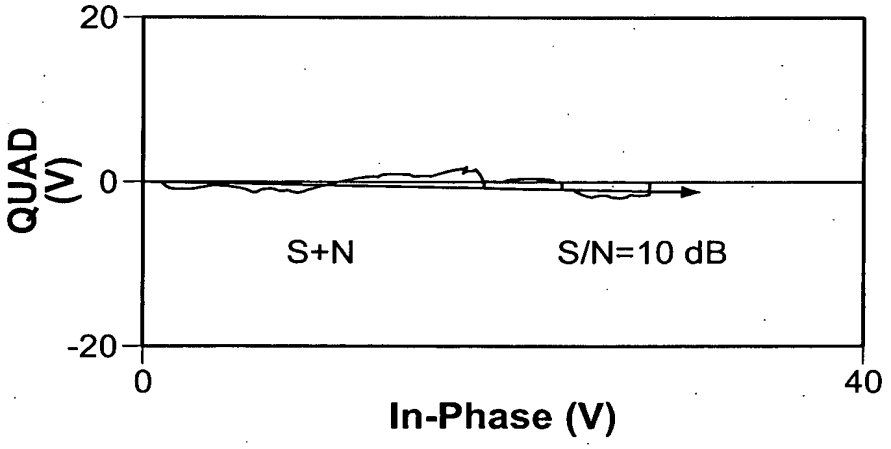

FIG. 3B

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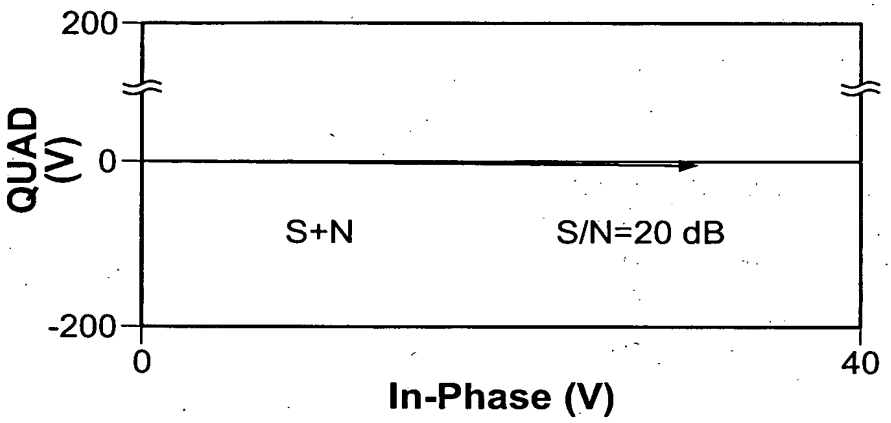
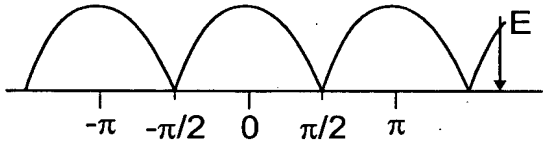
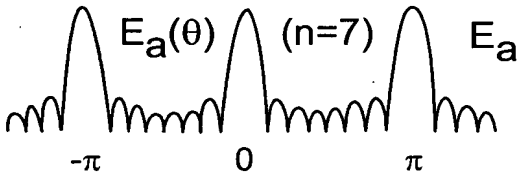


FIG. 3C



n=2
g=1

FIG. 4A



$$E_a(\theta) = \frac{\sin n\frac{\pi}{2} g \sin\theta}{n\frac{\pi}{2} g \sin\theta}$$

FIG. 4B

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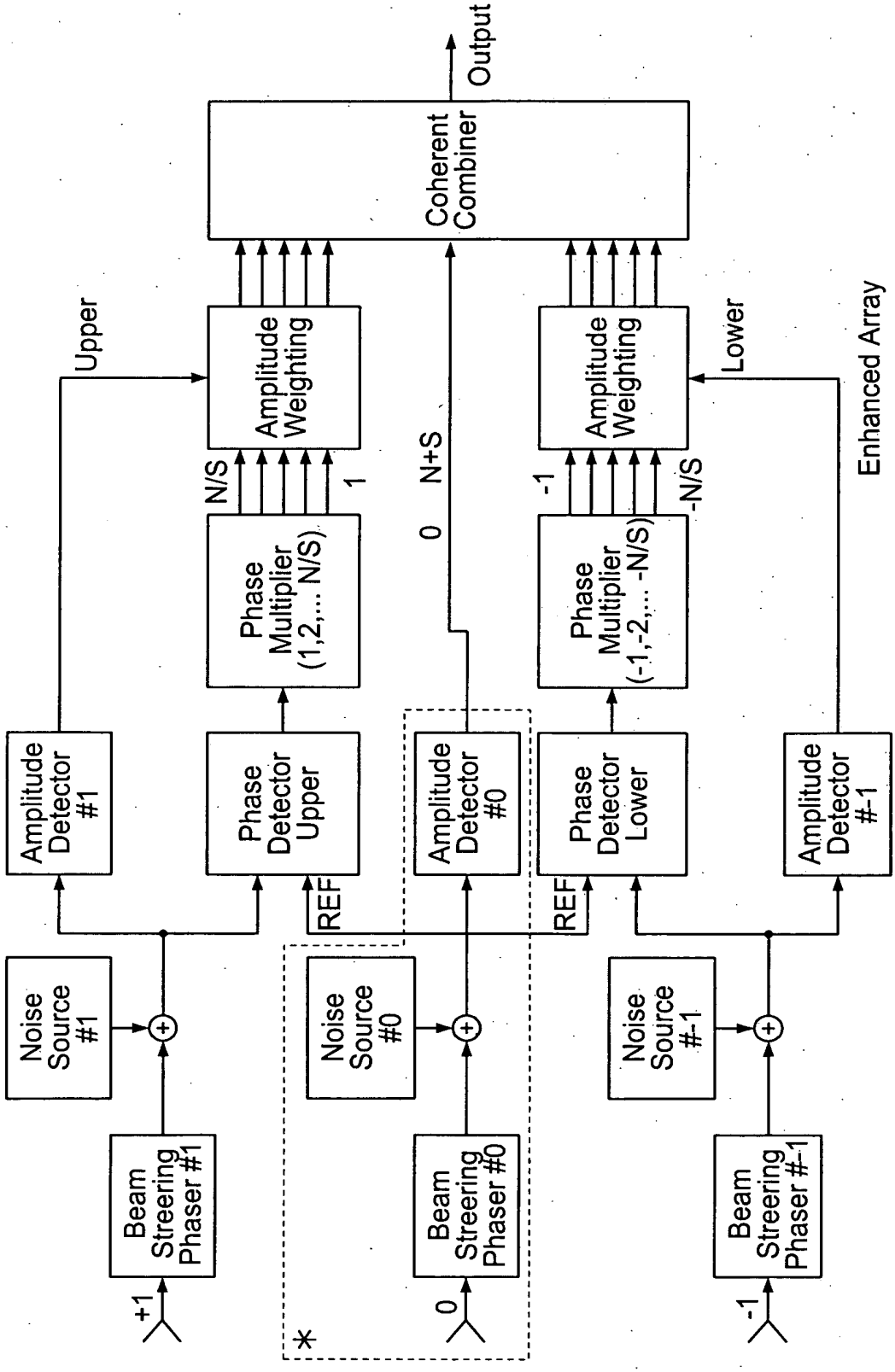

FIG. 5

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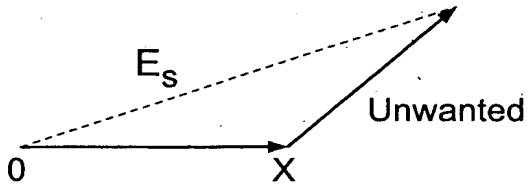

FIG. 6A

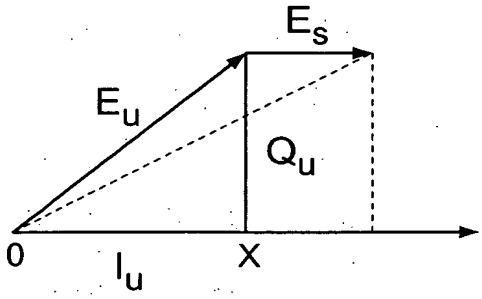

FIG. 6B

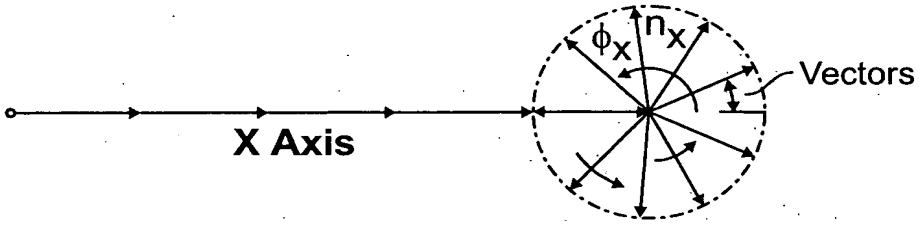

FIG. 6C

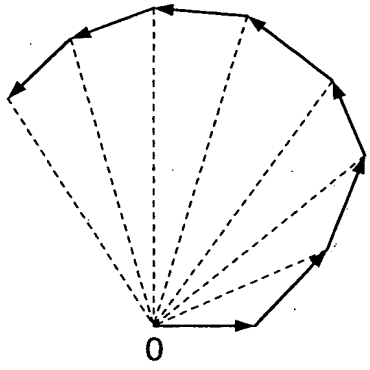

FIG. 6D

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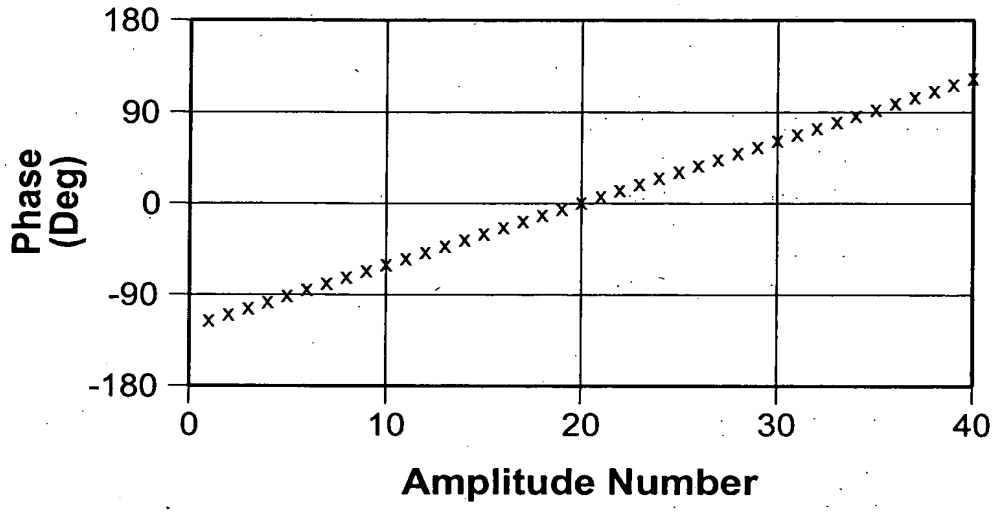

FIG. 7A

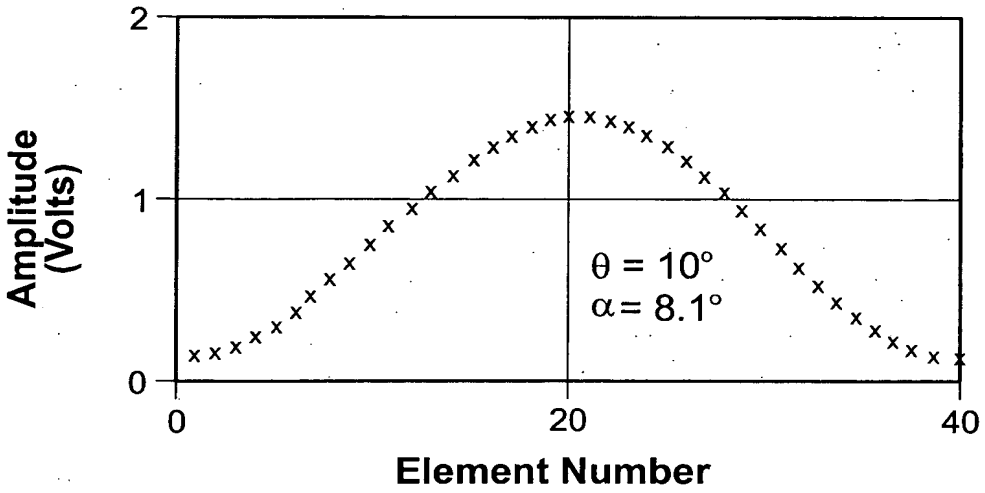

FIG. 7B

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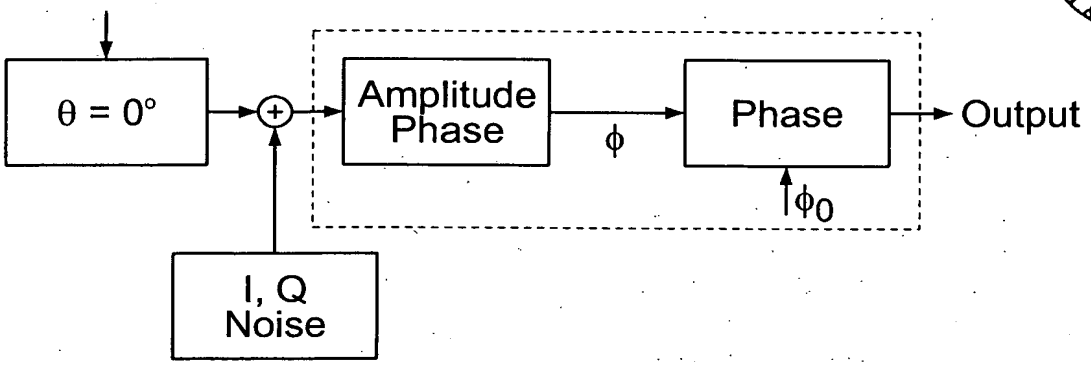

FIG. 8A

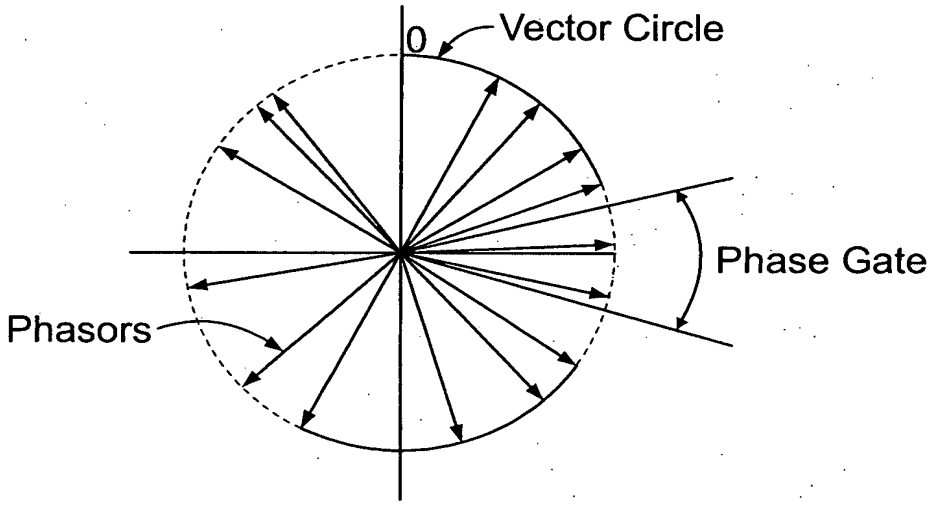

FIG. 8B

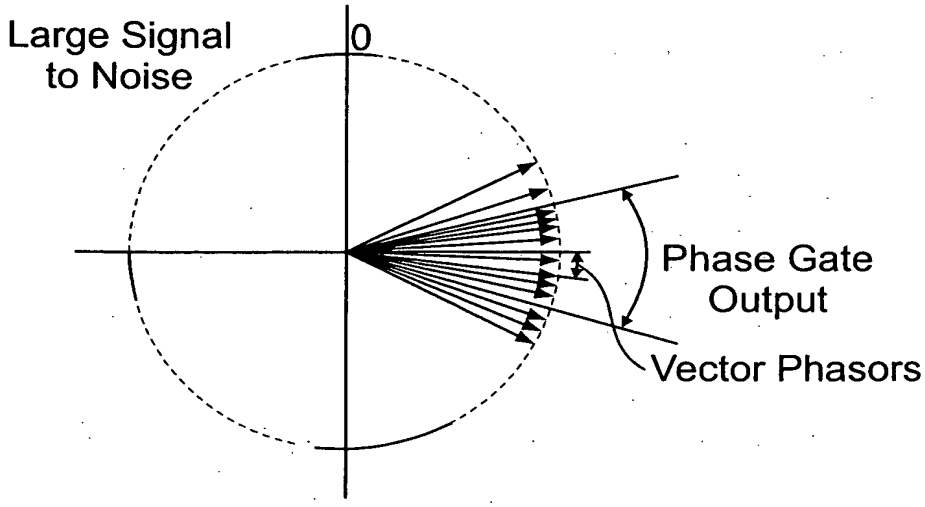

FIG. 8C

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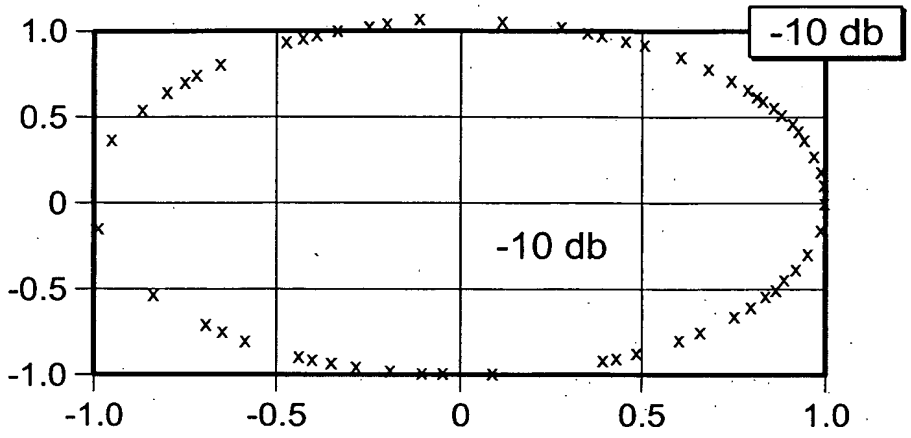

FIG. 9A-1

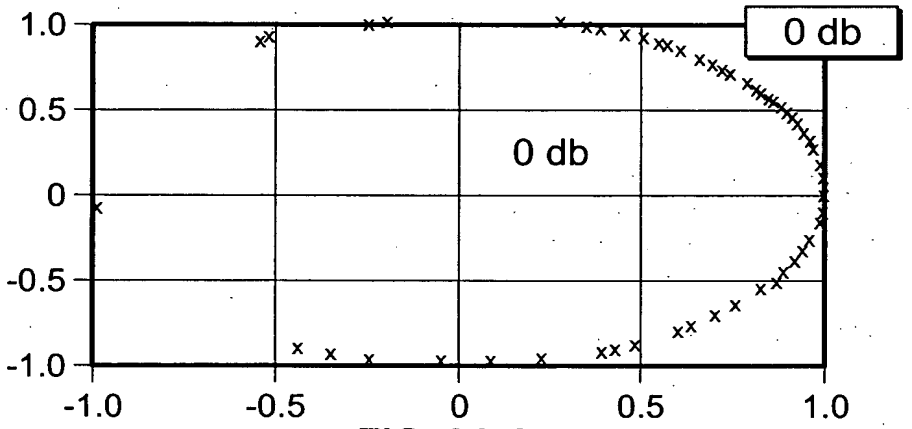

FIG. 9A-2

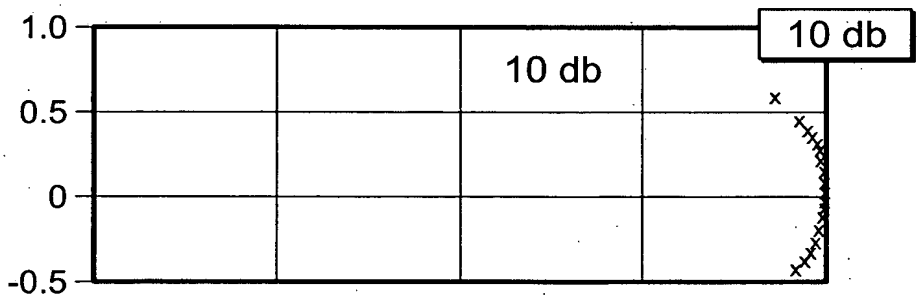

FIG. 9A-3

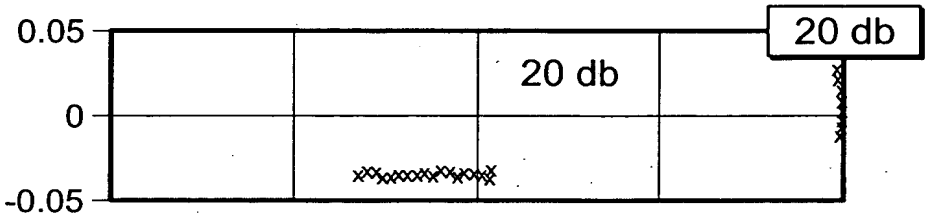

FIG. 9A-4

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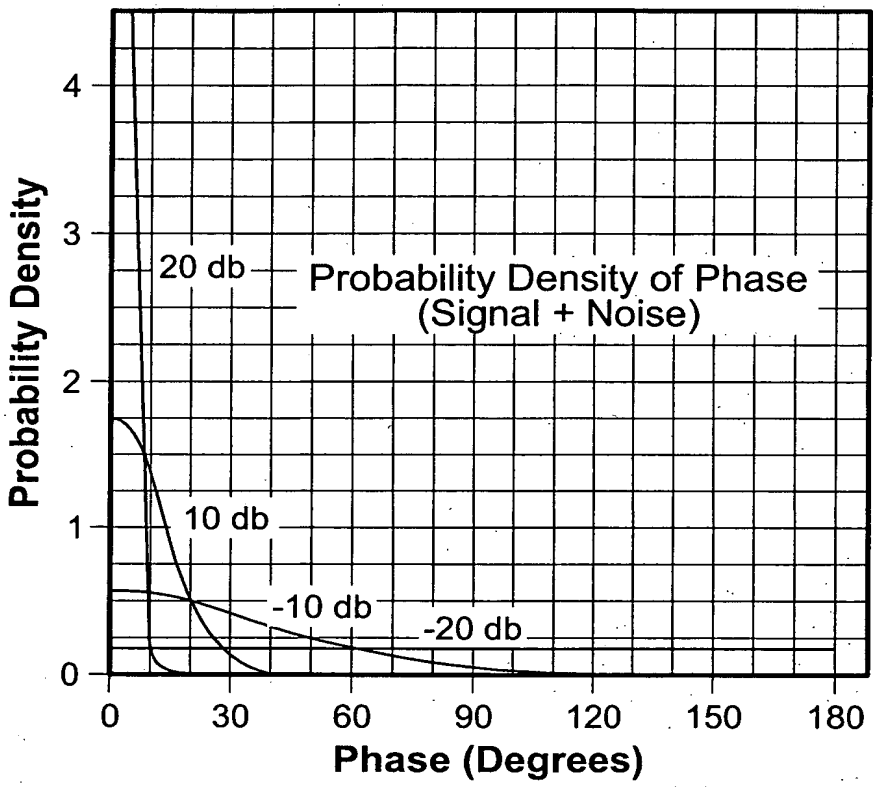


FIG. 9B

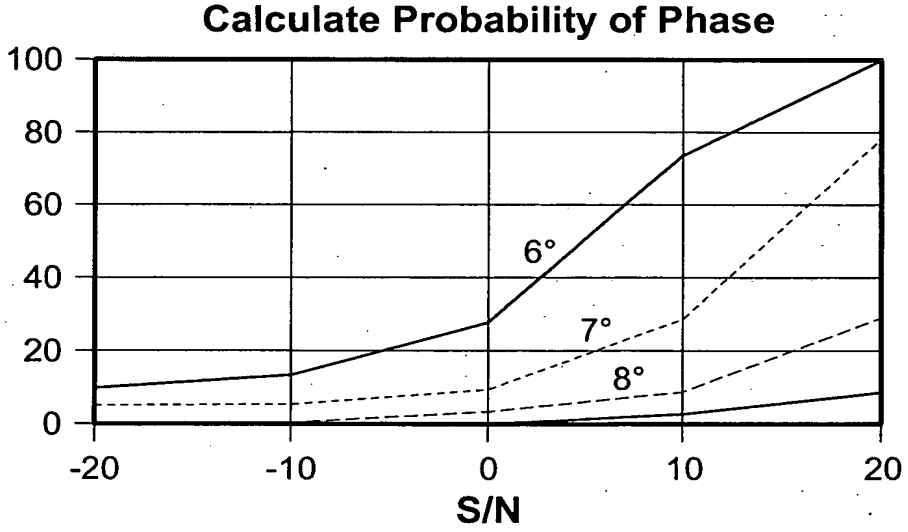
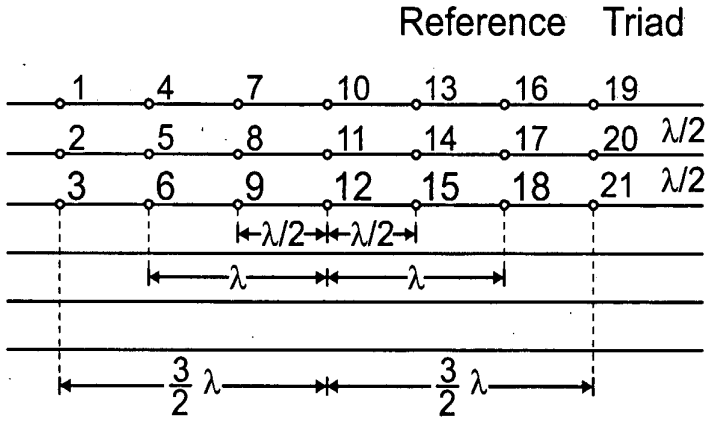


FIG. 9C

Title: Receiving System with Improved Directivity and Signal to Noise Ratio
Inventor: Harry B. Smith
Serial No.: 09/453,526
Docket No.: 802.0002
Customer No.: 25534
Atty: Kevin M. Barner



7x3 Array Used In Simulation

FIG. 10A

========== 0 dB ========== Trial 16 ========== I data ==========

Contents of original I array

0. 7349	1. 3760	1. 1123	1. 4339	1. 0919	0. 7478	0. 8836	0. 3856	1. 7902	LEFT	
1. 7061	2. 3004	2. 3358								CENTER
0. 5273	1. 9065	2. 2319	0. 4199	-0. 5505	2. 2936	2. 1521	0. 3127	1. 2718	RIGHT	

After signs of right I elements reversed:

	---------- I values ----------											
1	0. 7349	4	1. 4339	7	0. 8836	10	1. 7061	13	-0. 5273	16	-0. 4199	19	-2. 152*
2	1. 3760	5	1. 0919	8	0. 3856	11	2. 3004	14	-1. 9065	17	0. 5505	20	-0. 312*
3	1. 1123	6	0. 7478	9	1. 7902	12	2. 3358	15	-2. 2319	18	-2. 2936	21	-1. 271*
Sum	3. 2232		3. 2737		3. 0593		6. 3422		-4. 6657		-2. 1629		-3. 734*
Avg	1. 0744		1. 0912		1. 0198		2. 1141		-1. 5552		-0. 7210		-1. 245*

FIG. 10B

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========== 0 dB === ======== Trial 17 Group 2 ========== Q data ==========

Avg Q for sextet (w/ signs reversed) = 0.4769 ### Actual noise avg = -0.2302 ###

	Sextet Q	QA's QA	
4	0.0209	-0.4560	
5	0.3602	-0.1167	*
6	0.7111	0.2342	
16	0.0031	-0.4738	
17	-0.2578	-0.7347	
18	2.0240	1.5471	

Left	Right	Pair Avg(A)	TA		Q'A (C)	Delta(D)	Delta A(E)	Col 1	Col 2	Col 3
4	16	0.0089	0.0120	b	-0.4649	0.0031	-0.5867	-0.1217		
4	17	0.1394	-0.1185		-0.5954	-0.2578	-0.8476		-0.2522	
4	18	-1.0016	1.0225		0.5455	2.0240	1.4342			0.8887
5	16	0.1786	0.1817	b	-0.2953	0.0031	-0.5867	-0.2914		
5	17	0.3090	0.0512		-0.4257	-0.2578	-0.8476		-0.4218	
5	18	-0.8319	1.1921		0.7152	2.0240	1.4342			0.7191
6	16	0.3540	0.3571	x	-0.1198	0.0031	-0.5867	-0.4668		
6	17	0.4844	0.2267		-0.2503	-0.2578	-0.8476		-0.5973	
6	18	-0.6565	1.3676	#	0.8906	2.0240	1.4342			0.5436
Sum =		-1.0157	4.2923		-0.0000	5.3079	0.0000	-0.8800	-1.2714	2.1514
Avg =		-0.1129	0.4769		-0.0000	0.5898	0.0000	-0.2933	-0.4238	0.7171

Dispersion = 2.393 : 1 Comparison value = -0.2933

Dispersion sum = -0.4131
Dispersion dif = -0.1697
Dispersion ratio = 0.1369 --> divided by 3 = 0.0456

(Inherently indicated by bb or BB in non key entries)
All same polarity, ∴ averageable; low dispersion ratio
Case 1 average below threshold
Case 2 average above threshold
? Average between .73 to .83
Comparison value is average

(Expected A1)
Process A1

POLARITY of noise is: -

FIG. 11A

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========== 0 dB ========== Trial 2 Group 3 ========== Q data ==========

Avg Q for sextet (w/ signs reversed) = 0.1035 ### Actual noise avg = -0.2625 ###

	Sextet Q	QA's QA	
7	1.3410	1.2375	
8	1.0595	0.9560	
9	-0.6877	-0.7912	
13	-1.7936	-1.8971	
14	-0.5530	-0.6565	*
15	1.2550	1.1515	

Left	Right	Pair Avg(A)	B		Q'A (C)	Delta(D)	Delta A(E)	Col 1	Col 2	Col 3
7	13	1.5673	-0.3263		-0.3298	-1.7936	-1.4297			-1.0999
7	14	0.9470	0.3940	b	0.2905	-0.5530	-0.1891	-0.4796		
7	15	0.0430	1.2980		1.1945	1.2550	1.6189		0.4244	
8	13	1.4266	-0.3671		-0.4706	-1.7936	-1.4297			-0.9592
8	14	0.8063	0.2533	x	0.1497	-0.5530	-0.1891	-0.3389		
8	15	-0.0977	1.1573		1.0537	1.2550	1.6189		0.5651	
9	13	0.5530	-1.2407	#	-1.3442	-1.7936	-1.4297			-0.0856
9	14	-0.0673	-0.6204	B	-0.7239	-0.5530	-0.1891	0.5348		
9	15	-0.9713	0.2837		0.1801	1.2550	1.6189		1.4388	
Sum =		4.2066	0.9318		0.0000	-3.2748	0.0000	-0.2837	2.4283	-2.1446
Avg =		0.4674	0.1035		0.0000	-0.3639	0.0000		0.8094	-0.7149

Dispersion = -1.115 : 1 Comparison value = -0.2837

Dispersion sum = 0.0552
Dispersion dif = 1.0144
Dispersion ratio = 0.0544

(Inherently Bb combination)
One odd polarity, ∴ use sum: dispersion ratio low
Case 1 Σ less than threshold
Case 2 presence of sizable B
sizable = > 67% of # in IA' column, where # is maximum value of polarity opposite to * polarity

(Expected B1)
Process B1 POLARITY of noise is: -

FIG. 11B

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========== 0 dB ========== Trial 1 Group 3 ========== Q data ==========

Avg Q for sextet (w/ signs reversed) = 1.1320 ### Actual noise avg = 0.7660 ###

	Sextet Q	QA's QA
7	1.6680	0.5860
8	0.2348	-0.8972
9	0.6360	-0.4960
13	2.2163	1.0843
14	0.8563	-0.2757
15	1.1806	0.0486 *

Left	Right	Pair Avg(A)	B		Q'A (C)	Delta(D)	Delta A(E)	Col 1	Col 2	Col 3
7	13	-0.2742	1.9422	b	0.8101	2.2163	0.7986	-0.0116		
7	14	0.4059	1.2622		0.1301	0.8563	-0.5614		-0.6916	
7	15	0.2437	1.4243		0.2923	1.1806	-0.2371			-0.5294
8	13	-0.9908	1.2256	x	0.0935	2.2163	0.7986	0.7050		
8	14	-0.3108	0.5456	#	-0.5865	0.8563	-0.5614		0.0250	
8	15	-0.4729	0.7077		-0.4243	1.1806	-0.2371			0.1872
9	13	-0.7901	1.4262	b	0.2941	2.2163	0.7986	0.5044		
9	14	-0.1102	0.7462		-0.3859	0.8563	-0.5614		-0.1756	
9	15	-0.2723	0.9083		-0.2237	1.1806	-0.2371			-0.0134
Sum =		-2.5716	10.1880		-0.0000	12.7596	0.0000	1.1979	-0.8421	-0.3557
Avg =		-0.2857	1.1320		-0.0000	1.4177	0.0000			

Dispersion = -43.547 : 1 Comparison value = 0.7050

Dispersion sum = 0.4928
Dispersion dif = 0.5160
Dispersion ratio = 0.9551

(Inherently bb or BB)
Use key or * entry; high dispersion ratio
Case 1 less than .73
Case 2 greater than .83
Comparison value is * index entry

(Expected C1)
Process C1 POLARITY of noise is: +

FIG. 11C

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========== 0 dB ========== Trial 4 Group 1 ========== Q data ==========

Avg Q for sextet (w/ signs reversed) = 1.1629 ### Actual noise avg = 0.1628 ###

	Sextet Q	QA's QA
1	2.6625	1.4997
2	1.9091	0.7462
3	1.0166	-0.1463*
19	1.9264	0.7635
20	0.1684	-0.9945
21	-0.7059	-1.8688

Left	Right	Pair Avg(A)	B		Q'A (C)	Delta(D)	Delta A(E)		Col 1	Col 2	Col 3
1	19	0.3681	2.2945	#	1.1316	1.9264	1.4634				0.3318
1	20	1.2471	1.4155	B	0.2526	0.1684	-0.2946	x	-0.5472		
1	21	1.6842	0.9783		-0.1846	-0.7059	-1.1689			-0.9843	
2	19	-0.0086	1.9178		0.7549	1.9264	1.4634				0.7085
2	20	0.8704	1.0388	x	-0.1241	0.1684	-0.2946		-0.1705		
2	21	1.3075	0.6016		-0.5613	-0.7059	-1.1689			-0.6076	
3	19	-0.4549	1.4715		0.3086	1.9264	1.4634				1.1548
3	20	0.4241	0.5925	b	-0.5704	0.1684	-0.2946		0.2758		
3	21	0.8613	0.1554		-1.0075	-0.7059	-1.1689			-0.1614	
Sum =		6.2990	10.4657		-0.0000	4.1667	0.0000		-0.4418	-1.7533	2.1952
Avg =		0.6999	1.1629		-0.0000	0.4630	0.0000			-0.5844	0.7317

Dispersion = -1.984 : 1 Comparison value = 0.1053

Dispersion sum = -0.2714
Dispersion dif = -0.8230
Dispersion ratio = 0.3298

(Inherently bB) high dispersion ratio
Eliminate B When Σ < abs 11.31
Eliminate (b) When Σ > 11.31
Case 1 less than .73
Case 2 greater than .83

(Expected D1)
Process D1 POLARITY of noise is: +

FIG. 11D

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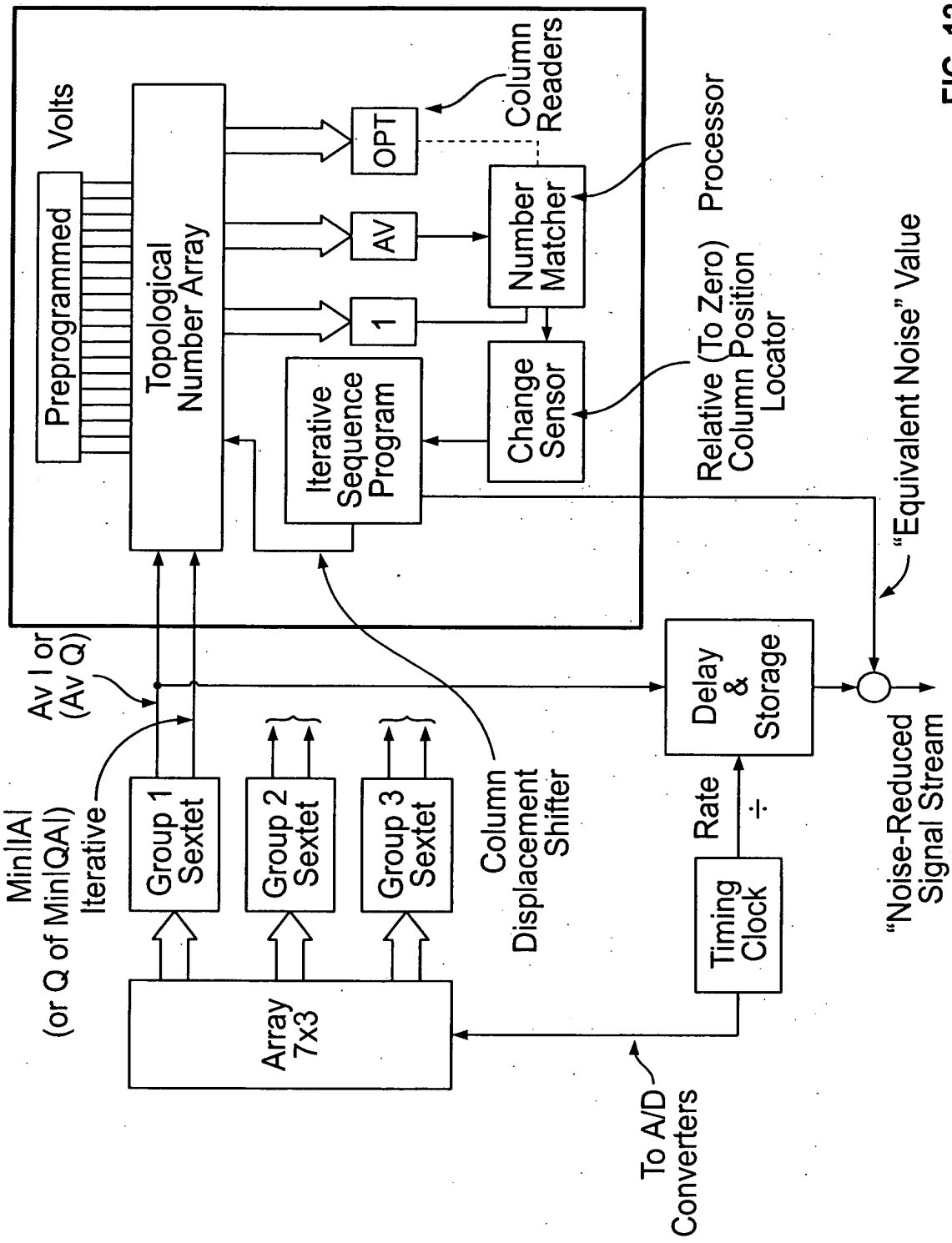

FIG. 12A

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Block Diagram Iterative Processing Scheme

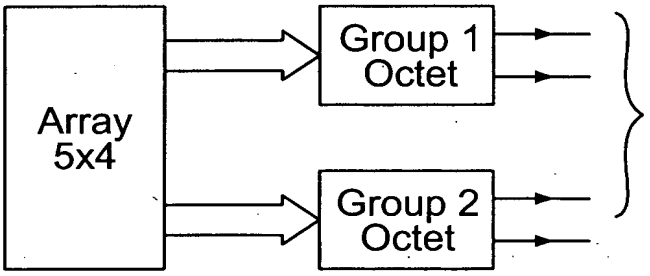

FIG. 12B

Regular & Reverse "Scans"

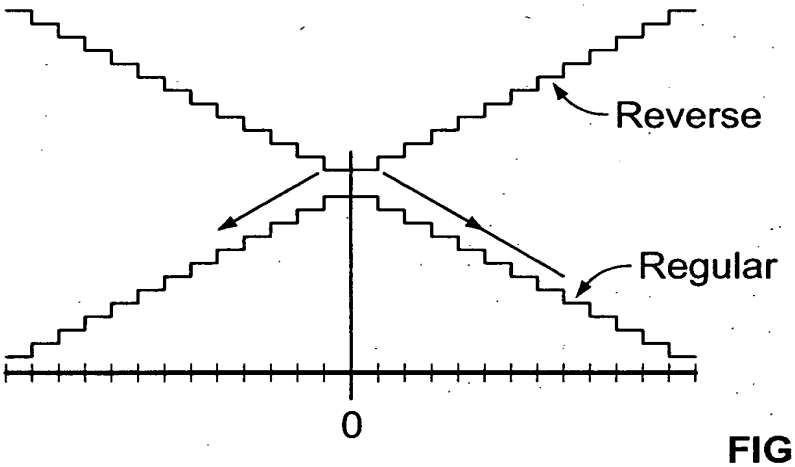

FIG. 12C

Composite "V" Scan & "A" Scan

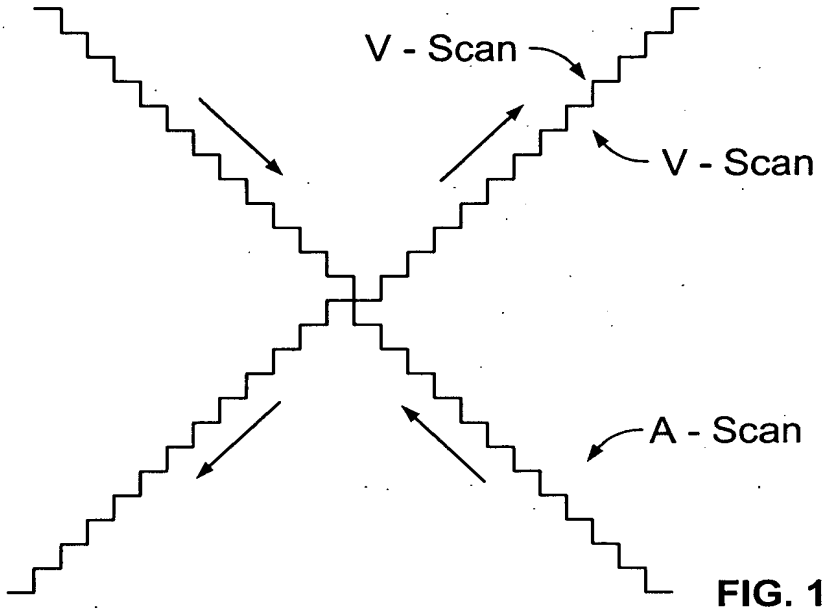

FIG. 12D

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=== I data === Group 1 Noise Averages ### ### Avgs Scanned In Opposite Sense ###

	Min IA	-0.9v	-0.85v	-0.80v	-0.75v	-0.70v	-0.65v	-0.60v	-0.55v	-0.50v	-0.45v	-0.40v	-0.35v	-0.30v	-0.25v	-0.20v	-0.15v	-0.1v
Avg 20B	0.041	1.206 -0.552	1.156 -0.502	1.106 -0.452	1.056 -0.402	1.006 -0.352	1.956 -0.302	0.906 -0.252	0.856 -0.202	0.806 -0.152	0.756 -0.102	0.706 -0.052	0.656 -0.002	0.606 0.048	0.556 0.098	0.506 0.148	0.456 0.198	0.406 0.248
Avg 21A	-0.052	-0.691 -1.161	0.641 -1.111	0.591 -1.061	0.541 -1.011	0.491 -.961	0.441 -0.911	0.391 -0.861	0.341 -0.811	0.291 -0.761	0.241 -0.711	0.191 -0.661	0.141 -0.611	0.091 -0.561	0.041 -0.511	-0.009 -0.461	-0.059 -0.411	-0.109 -0.361
Avg 22A	0.060	0.735 -1.005	0.685 -0.955	0.635 -0.905	0.585 -0.855	0.535 -0.805	0.485 -0.755	0.435 -0.705	0.385 -0.655	0.335 -0.605	0.285 -0.555	0.235 -0.505	0.185 -0.455	0.135 -0.405	0.085 -0.355	0.035 -0.305	-0.015 -0.255	-0.065 -0.205
Avg 23A	0.022	0.654 -1.124	0.604 -1.074	0.554 -1.024	0.504 -0.974	0.454 -0.924	0.404 -0.874	0.354 -0.824	0.304 -0.774	0.254 -0.724	0.204 -0.674	0.154 -0.624	0.104 -0.574	0.054 -0.524	0.004 -0.474	-0.046 -0.424	-0.096 -0.374	-0.146 -0.324
Avg 24A	-0.002	1.166 -0.637	1.116 -0.587	1.066 -0.537	1.016 -0.487	0.966 -0.437	0.916 -0.387	0.866 -0.337	0.816 -0.287	0.766 -0.237	0.716 -0.187	0.666 -0.137	0.616 -0.087	0.566 -0.037	0.516 0.013	0.466 0.063	0.416 0.113	0.366 0.163
Avg 25B	-0.032	1.100 -0.732	1.050 -0.682	1.000 -0.632	0.950 -0.582	0.900 -0.532	0.850 -0.482	0.800 -0.432	0.750 -0.382	0.700 -0.332	0.650 -0.282	0.600 -0.232	0.550 -0.182	0.500 -0.132	0.450 -0.082	0.400 -0.032	0.350 0.018	0.300 0.068
Avg 26B	-0.169	0.487 -1.481	0.437 -1.431	0.387 -1.381	0.337 -1.331	0.287 -1.281	0.237 -1.231	0.187 -1.181	0.137 -1.131	0.087 -1.081	0.037 -1.031	-0.013 -0.981	-0.063 -0.931	-0.113 -0.881	-0.163 -0.831	-0.213 -0.781	-0.263 -0.731	-0.313 -0.681
Avg 27A	-0.120	0.924 -0.756	0.874 -0.706	0.824 -0.656	0.774 -0.606	0.724 -0.556	0.674 -0.506	0.624 -0.456	0.574 -0.406	0.524 -0.356	0.474 -0.306	0.424 -0.256	0.374 -0.206	0.324 -0.156	0.274 -0.106	0.224 -0.056	0.174 0.006	0.124 0.044
Avg 28C	-0.178	0.782 -0.840	0.732 -0.790	0.682 -0.740	0.632 -0.690	0.582 -0.640	0.532 -0.590	0.482 -0.540	0.432 -0.490	0.382 -0.440	0.332 -0.390	0.282 -0.340	0.232 -0290.	0.182 -0.240	0.132 -0.190	0.082 -0.140	0.032 -0.090	-0.018 -0.040
Avg 29C	-0.129	1.246 -0.683	1.196 -0.633	1.146 -0.583	1.096 -0.533	1.046 -0.483	0.996 -0.433	0.946 -0.383	0.896 -0.333	0.846 -0.283	0.796 -0.233	0.746 -0.183	0.696 -0.133	0.646 -0.083	0.596 -0.033	0.546 0.017	0.496 0.067	0.446 0.117
Avg 30B	0.032	0.848 -0.921	0.798 -0.871	0.748 -0.821	0.698 -0.771	0.648 -0.721	0.598 -0.671	0.548 -0.621	0.498 -0.571	0.448 -0.521	0.398 -0.471	0.348 -0.421	0.298 -0.371	0.248 -0.321	0.198 -0.271	0.148 -0.221	0.098 -0.171	0.048 -0.121
Avg 31C	-0.174	0.786 -1.187	0.736 -1.137	0.686 -1.087	0.636 -0.037	0.586 -0.987	0.536 -0.937	0.486 -0.887	0.436 -0.837	0.386 -0.787	0.336 -0.737	0.286 -0.687	0.236 -0.637	0.186 -0.587	0.136 -0.537	0.086 -0.487	0.036 -0.437	-0.014 -0.387
Avg 32C	-0.015	1.060 -0.755	1.010 -0.705	0.960 -0.655	0.910 -0.605	0.860 -0.555	0.810 -0.505	0.760 -0.455	0.710 -0.405	0.660 -0.355	0.610 -0.305	0.560 -0.255	0.510 -0.205	0.460 -0.155	0.410 -0.105	0.360 -0.055	0.310 -0.005	0.260 0.045
Avg 33C	-0.080	0.993 -0.887	0.943 -0.837	0.893 -0.787	0.843 -0.737	0.793 -0.687	0.743 -0.637	0.693 -0.587	0.643 -0.537	0.593 -0.487	0.543 -0.437	0.493 -0.387	0.443 -0.337	0.393 -0.287	0.343 -0.237	0.393 -0.187	0.243 -0.137	0.193 -0.087
Avg 34A	-0.203	0.530 -1.479	0.480 -1.429	0.430 -1.379	0.380 -1.329	0.330 -1.279	0.280 -1.229	0.230 -1.179	0.180 -1.129	0.130 -1.079	0.080 -1.029	0.030 -0.979	-0.020 -0.929	-0.070 -0.879	-0.120 -0.829	-0.170 -0.779	-0.220 -0.729	-0.270 -0.679
Avg 35C	-0.083	1.035 -0.848	0.985 -0.798	0.935 -0.748	0.885 -0.698	0.835 -0.648	0.785 -0.598	0.735 -0.548	0.685 -0.498	0.635 -0.448	0.585 -0.398	0.535 -0.348	0.485 0.298	0.435 -0.248	0.385 -0.198	0.335 -0.148	0.285 -0.098	0.235 -0.048
Avg 36B	-0.212	1.171 -0.841	1.121 -0.791	1.071 -0.741	1.021 -0.691	0.971 -0.641	0.921 -0.591	0.871 -0.541	0.821 -0.491	0.771 -0.441	0.721 -0.391	0.671 -0.341	0.621 -0.291	0.571 -0.241	0.521 -0.191	0.471 -0.141	0.421 -0.091	0.371 -0.041
Avg 37C	0.015	1.024 -0.761	0.974 -0.711	0.924 -0.661	0.874 -0.611	0.824 -0.561	0.774 -0.511	0.724 -0.461	0.674 -0.411	0.624 -0.361	0.574 -0.311	0.524 -0.261	0.474 -0.211	0.424 -0.161	0.374 -0.111	0.324 -0.061	0.274 -0.011	0.224 0.039
Avg 38B	0.003	0.616 -1.181	0.566 -1.131	0.516 -1.081	0.466 -1.031	0.416 -0.981	0.366 -0.931	0.316 -0.881	0.266 -0.831	0.216 -0.781	0.166 -0.731	0.116 -0.681	0.066 -0.631	0.016 -0.581	-0.034 -0.531	-0.084 -0.481	-0.134 -0.431	-0.184 -0.381

FIG. 13A

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=== I data ===	Group 1 ### Noise Averages ###

-0.05V	0.00V	0.05V	0.10V	0.15V	0.20V	0.25V	0.30V	0.35V	0.40V	0.45V	0.50V	0.55V	0.60V	0.65V	0.70V	0.75V
0.356	0.306	0.256	0.206	0.156	0.106	0.056	-0.006	-0.044	-0.094	-0.144	-0.194	-0.244	-0.294	-0.344	-0.394	-0.444
0.298	0.348	0.398	0.448	0.498	0.548	0.598	0.648	0.698	0.748	0.798	0.848	0.898	0.948	0.998	1.048	1.098
-0.159	-0.209	-0.259	-0.309	-0.359	-0.409	-0.459	-0.509	-0.559	0.609	-0.659	-0.709	-0.759	-0.809	-0.859	-0.909	-0.959
-0.311	-0.261	-0.211	-0.161	-0.111	-0.061	-0.011	0.039	0.089	0.139	0.189	0.239	0.289	0.339	0.389	0.439	0.489
-0.115	-0.165	-0.215	-0.265	-0.315	-0.365	-0.415	-0.465	-0.515	-0.565	-0.615	-0.665	-0.715	-0.765	-0.815	-0.865	-0.915
-0.155	-0.105	-0.055	-0.005	0.045	0.095	0.145	0.195	0.245	0.295	0.315	0.395	0.445	0.495	0.545	0.595	0.645
-0.196	-0.246	-0.296	-0.346	-0.396	-0.446	-0.496	-0.546	-0.596	-0.646	-0.696	-0.746	-0.796	-0.846	-0.896	-0.946	-0.996
-0.274	-0.224	-0.174	-0.124	-0.074	-0.024	0.026	0.076	0.126	0.176	0.226	0.276	0.326	0.376	0.426	0.476	0.526
0.316	0.266	0.216	0.166	0.116	0.066	-0.016	-0.034	-0.084	-0.134	-0.184	-0.234	-0.284	-0.334	-0.384	-0.434	-0.484
0.213	0.263	0.313	0.363	0.413	0.463	0.513	0.563	0.613	0.663	0.713	0.763	0.813	0.863	0.913	0.963	1.013
0.250	0.200	0.150	0.100	0.050	0.000	-0.050	-0.100	-0.150	-0.200	-0.250	-0.300	-0.350	-0.400	-0.450	-0.500	-0.550
0.118	0.168	0.218	0.268	0.318	0.368	0.418	0.468	0.518	0.568	0.618	0.668	0.718	0.768	0.818	0.868	0.918
-0.363	-0.413	-0.463	-0.513	-0.563	-0.613	-0.663	-0.713	-0.763	-0.813	-0.863	-0.913	-0.963	-1.013	-1.063	-1.113	-1.163
-0.631	-0.581	-0.531	-0.481	-0.431	-0.381	-0.331	-0.281	-0.231	-0.181	-0.131	-0.081	-0.031	0.019	0.069	0.119	0.169
0.074	-0.024	-0.026	-0.076	-0.126	-0.176	-0.226	-0.276	-0.326	-0.376	-0.426	-0.476	-0.526	-0.576	-0.626	-0.676	-0.726
0.094	0.144	0.194	0.244	0.294	0.344	0.394	0.444	0.484	0.544	0.594	0.644	0.684	0.744	0.784	0.844	0.884
-0.068	-0.118	-0.168	-0.218	-0.268	-0.318	-0.368	-0.418	-0.468	-0.518	-0.568	-0.618	-0.668	-0.718	-0.768	-0.818	-0.868
0.010	0.060	0.110	0.160	0.210	0.260	0.310	0.360	0.410	0.460	0.510	0.560	0.610	0.660	0.710	0.760	0.810
0.396	0.346	0.296	0.246	0.196	0.146	0.096	0.046	-0.004	-0.054	-0.104	-0.154	-0.204	-0.254	-0.304	-0.354	-0.404
0.167	0.217	0.267	0.317	0.367	0.417	0.467	0.517	0.567	0.617	0.667	0.717	0.767	0.817	0.867	0.917	0.967
-0.002	-0.052	-0.102	-0.152	-0.202	-0.252	-0.302	-0.352	-0.402	-0.452	-0.502	-0.552	-0.602	-0.652	-0.702	-0.752	-0.802
-0.071	0.021	0.029	0.079	0.129	0.179	0.229	0.279	0.329	0.379	0.429	0.479	0.529	0.579	0.629	0.679	0.729
-0.064	-0.114	-0.164	-0.214	-0.264	-0.314	-0.364	-0.414	-0.464	-0.514	-0.564	-0.614	-0.664	-0.714	-0.764	-0.814	-0.864
-0.337	-0.287	-0.237	-0.187	-0.137	-0.087	-0.037	0.013	0.063	0.113	0.163	0.213	0.263	0.313	0.363	0.413	0.463
0.210	0.160	0.110	0.060	0.010	-0.040	-0.090	-0.140	-0.190	-0.240	-0.290	-0.340	-0.390	-0.440	-0.490	-0.540	-0.590
0.095	0.145	0.195	0.245	0.295	0.345	0.395	0.445	0.495	0.545	0.595	0.645	0.695	0.745	0.795	0.845	0.895
0.143	0.093	0.043	-0.007	-0.057	-0.107	-0.157	-0.207	-0.257	-0.307	-0.357	-0.407	-0.457	-0.507	-0.557	-0.607	-0.657
-0.037	0.013	0.063	0.113	0.163	0.213	0.263	0.313	0.363	0.413	0.463	0.513	0.563	0.613	0.663	0.713	0.763
-0.320	-0.370	-0.420	-0.470	-0.520	-0.570	-0.620	-0.670	-0.720	-0.770	-0.820	-0.870	-0.920	-0.970	-1.020	-1.070	-1.120
-0.629	-0.579	-0.529	-0.479	-0.429	-0.379	-0.329	-0.279	-0.229	-0.179	-0.129	-0.079	-0.029	0.021	0.071	0.121	0.171
0.185	0.135	0.085	0.035	-0.015	-0.065	-0.115	-0.165	-0.215	-0.265	-0.315	-0.365	-0.415	-0.465	-0.515	-0.565	-0.615
0.002	0.052	0.102	0.152	0.202	0.252	0.302	0.352	0.402	0.452	0.502	0.552	0.602	0.652	0.702	0.752	0.802
0.321	0.271	0.221	0.171	0.121	0.071	0.021	-0.029	-0.079	-0.129	-0.179	-0.229	-0.279	-0.329	-0.379	-0.429	-0.479
0.009	0.059	0.109	0.159	0.209	0.259	0.309	0.359	0.409	0.459	0.509	0.559	0.609	0.659	0.709	0.759	0.809
0.174	0.124	0.074	-0.024	-0.026	-0.076	-0.126	-0.176	-0.226	-0.276	-0.326	-0.376	-0.426	-0.476	-0.526	-0.576	-0.626
0.089	0.139	0.189	0.239	0.289	0.339	0.389	0.439	0.489	0.539	0.589	0.639	0.689	0.739	0.789	0.839	0.889
-0.234	-0.284	-0.334	-0.384	-0.434	-0.484	-0.534	-0.584	-0.634	-0.684	-0.734	-0.784	-0.834	-0.884	-0.934	-0.984	-1.034
-0.331	-0.281	-0.231	-0.181	-0.131	-0.081	-0.031	0.019	0.069	0.119	0.169	0.219	0.269	0.319	0.369	0.419	0.469

FIG. 13B

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=== I data === 0 dB === Group 1 Average I Values ### Avgs Scanned In Opposite Sense ###

	Min IA	-.9v	-.85v	-.8v	-.75v	-.7v	-.65v	-.6v	-.55v	-.5v	-.45v	-.4v	-.35v	-.3v	-.25v	-.2v	-.15v	-.1v
Avg 20B	0.041	2.431 0.672	2.381 0.722	2.331 0.772	2.281 0.822	2.231 0.872	2.181 0.922	2.131 0.972	2.081 1.022	2.031 1.072	1.981 1.122	1.931 1.172	1.881 1.222	1.831 1.272	1.781 1.322	1.731 1.372	1.681 1.422	1.631 1.472
Avg 21A	-0.052	1.916 0.064	1.866 0.114	1.816 0.164	1.766 0.214	1.716 0.264	1.666 0.314	1.616 0.364	1.566 0.414	1.516 0.464	1.466 0.514	1.416 0.564	1.366 0.614	1.316 0.664	1.266 0.714	1.216 0.764	1.166 0.814	1.116 0.864
Avg 22A	0.060	1.960 0.220	1.910 0.270	1.860 0.320	1.810 0.370	1.760 0.420	1.710 0.470	1.660 0.520	1.610 0.570	1.560 0.620	1.510 0.670	1.460 0.720	1.410 0.770	1.360 0.820	1.310 0.870	1.260 0.920	1.210 0.970	1.160 1.020
Avg 23A	0.022	1.878 0.101	1.828 0.151	1.778 0.201	1.728 0.251	1.678 0.301	1.628 0.351	1.578 0.401	1.528 0.451	1.478 0.501	1.428 0.551	1.378 0.601	1.328 0.651	1.278 0.701	1.228 1.751	1.178 0.801	1.128 0.851	1.078 0.901
Avg 24A	-0.002	2.390 0.588	2.340 0.638	2.290 0.688	2.240 0.738	2.190 0.788	2.140 0.838	2.090 0.888	2.040 0.938	1.990 0.988	1.940 1.038	1.890 1.088	1.840 1.138	1.790 1.188	1.740 1.238	1.690 1.288	1.640 1.338	1.590 1.388
Avg 25B	-0.032	2.325 0.493	2.275 0.543	2.225 0.593	2.175 -0.643	2.125 0.693	2.075 0.743	2.025 0.793	1.975 0.843	1.925 0.893	1.875 0.943	1.825 0.993	1.775 1.043	1.725 1.093	1.675 1.143	1.625 1.193	1.575 1.243	1.525 1.293
Avg 26B	-0.169	1.712 -0.257	1.662 -0.207	1.612 -0.157	1.562 -0.107	1.512 -0.057	1.462 -0.007	1.412 0.043	1.362 0.093	1.312 0.143	1.262 0.193	1.212 0.243	1.162 0.293	1.112 0.343	1.062 0.393	0.012 0.443	0.962 0.493	0.912 0.543
Avg 27A	0.120	2.149 0.468	2.099 0.518	2.049 0.568	1.999 0.618	1.949 0.668	1.899 0.718	1.849 0.768	1.799 0.818	1.749 0.868	1.699 0.918	1.649 0.968	1.599 1.018	1.549 1.068	1.499 1.118	1.449 1.168	1.399 1.218	1.349 1.268
Avg 28C	0.178	2.007 0.385	1.957 0.435	1.907 0.485	1.857 0.535	1.807 0.585	1.757 0.635	1.707 0.685	1.657 0.735	1.607 0.785	1.557 0.835	1.507 0.885	1.457 0.935	1.407 0.985	1.357 1.035	1.307 1.085	1.257 1.135	1.207 1.185
Avg 29C	-0.129	2.471 0.542	2.421 0.592	2.371 0.642	2.321 0.692	2.271 0.742	2.221 0.792	2.171 0.842	2.121 0.892	2.071 0.942	2.021 0.992	1.971 1.042	1.921 1.092	1.871 1.142	1.821 1.192	1.771 1.242	1.721 1.292	1.671 1.342
Avg 30B	0.032	2.073 0.304	2.023 0.354	1.973 0.404	1.923 0.454	1.873 0.504	1.823 0.554	1.773 0.604	1.723 0.654	1.673 0.704	1.623 0.754	1.573 0.804	1.523 0.854	1.473 0.904	1.423 0.954	1.373 1.004	1.323 1.054	1.273 1.104
Avg 31C	-0.174	2.011 0.037	1.961 0.087	1.911 0.137	1.861 0.187	1.811 0.237	1.761 0.287	1.711 0.337	1.661 0.387	1.611 0.437	1.561 0.487	1.511 0.537	1.461 0.587	1.411 0.637	1.361 0.687	1.311 0.737	1.261 0.787	1.211 0.837
Avg 32C	-0.015	2.285 0.470	2.235 0.520	2.185 0.570	2.135 0.620	2.085 0.670	2.035 0.720	1.985 0.770	1.935 0.820	1.885 0.870	1.835 0.920	1.785 0.970	1.735 1.020	1.685 1.070	1.635 1.120	1.585 1.170	1.535 1.220	1.485 1.270
Avg 33C	-0.080	2.218 0.338	2.168 0.388	2.118 0.438	2.068 0.488	2.018 0.538	1.968 0.588	1.918 0.638	1.868 0.688	1.818 0.738	1.768 0.788	1.718 0.838	1.668 0.888	1.618 0.938	1.568 0.988	1.518 1.038	1.468 1.088	1.418 1.138
Avg 34A	-0.209	1.755 -0.255	1.705 -0.205	1.655 -0.155	1.605 -0.105	1.555 -0.055	1.505 -0.005	1.455 0.045	1.405 0.095	1.355 0.145	1.305 0.195	1.255 0.245	1.205 0.295	1.155 0.345	1.105 0.395	1.055 0.445	1.005 0.495	0.955 0.545
Avg 35C	-0.083	2.260 0.377	2.210 0.427	2.160 0.477	2.110 0.527	2.060 0.577	2.010 0.627	1.960 0.677	1.910 0.727	1.860 0.777	1.810 0.827	1.760 0.877	1.710 0.927	1.660 0.977	1.610 1.027	1.560 1.077	1.510 1.127	1.460 1.177
Avg 36B	-0.212	2.396 0.384	2.346 0.434	2.296 0.484	2.246 0.534	2.196 0.584	2.146 0.634	2.096 0.684	2.046 0.734	1.996 0.784	1.946 0.834	1.896 0.884	1.846 0.934	1.796 0.984	1.746 1.034	1.696 1.084	1.646 1.134	1.596 1.184
Avg 37C	0.015	2.249 0.463	2.199 0.513	2.149 0.563	2.099 0.613	2.049 0.663	1.999 0.713	1.949 0.763	1.899 0.813	1.849 0.863	1.799 0.913	1.749 0.963	1.699 1.013	1.649 1.063	1.599 1.113	1.549 1.163	1.499 1.213	1.449 1.263
Avg 38B	0.003	1.841 0.044	1.791 0.094	1.741 0.144	1.691 0.194	1.641 0.244	1.591 0.294	1.541 0.344	1.491 0.394	1.441 0.444	1.391 0.494	1.341 0.544	1.291 0.594	1.241 0.644	1.191 0.694	1.141 0.744	1.091 0.794	1.041 0.844

FIG. 13C

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=== I data === 0 dB === Group 1 Average I Values ↓

-.05 V	0 V	.05 V	.1 V	.15 V	.2 V	.25 V	.3 V	.35 V	.4 V	.45 V	.5 V	.55 V	.6 V	.65 V	.7 V	.75 V
1.581	1.531	1.481	1.431	1.381	1.331	1.281	1.231	1.181	1.131	1.081	1.031	0.981	0.931	0.861	0.831	0.781
1.522	1.572	1.622	1.672	1.722	1.772	1.822	1.872	1.922	1.972	2.022	2.072	2.122	2.172	2.222	2.272	2.322
1.066	1.016	0.966	0.916	0.866	0.816	0.766	0.716	0.666	1.616	0.566	0.516	0.466	0.416	0.366	0.316	0.266
0.914	0.964	1.014	1.064	1.114	1.164	1.214	1.264	1.314	1.364	1.414	1.464	1.514	1.564	1.614	1.664	1.714
1.110	1.060	1.010	0.960	0.910	0.860	0.810	0.760	0.710	0.660	0.610	0.560	0.510	0.460	0.410	0.360	0.310
1.070	1.120	1.170	1.220	1.270	1.320	1.370	1.420	1.470	1.520	1.570	1.620	1.670	1.720	1.770	1.820	1.870
1.028	0.978	0.928	0.878	0.828	0.778	0.728	0.678	0.628	0.578	0.528	0.478	0.428	0.378	0.328	0.278	0.228
0.951	1.001	1.051	1.101	1.151	1.201	1.251	1.301	1.351	1.401	1.451	1.501	1.551	1.601	1.651	1.701	1.751
1.540	1.490	1.440	1.390	1.340	1.290	1.240	1.190	1.140	1.090	1.040	0.990	0.940	0.890	0.840	0.790	0.740
1.438	1.488	1.538	1.588	1.638	1.688	1.738	1.788	1.838	1.888	1.938	1.988	2.038	2.088	2.138	2.188	2.238
1.475	1.425	1.375	1.325	1.275	1.225	1.175	1.125	1.075	1.025	0.975	0.925	0.875	0.825	0.775	0.725	0.675
1.343	1.393	1.443	1.493	1.543	1.593	1.643	1.693	1.743	1.793	1.843	1.893	1.943	1.993	2.043	2.093	2.143
0.862	0.812	0.762	0.712	0.662	0.612	0.562	0.512	0.462	0.412	0.362	0.312	0.262	0.212	0.162	0.112	0.062
0.593	0.643	0.693	0.743	0.793	0.843	0.893	0.943	0.993	1.043	1.093	1.143	1.193	1.243	1.293	1.343	1.393
1.299	1.249	1.199	1.149	1.093	1.049	0.999	0.949	0.899	0.849	0.799	0.749	0.699	0.649	0.599	0.549	0.499
1.318	1.368	1.418	1.468	1.518	1.568	1.618	1.668	1.718	1.768	1.818	1.868	1.918	1.968	2.018	2.068	2.118
1.157	1.107	1.057	1.007	0.957	0.907	0.857	0.807	0.757	0.707	0.657	0.607	0.557	0.507	0.457	0.407	0.357
1.235	1.285	1.335	1.385	1.435	1.485	1.535	1.585	1.635	1.685	1.735	1.785	1.835	1.885	1.935	1.985	2.035
1.621	1.571	1.521	1.471	1.421	1.371	1.321	1.271	1.221	1.171	1.121	1.071	1.021	0.971	0.921	0.871	0.821
1.392	1.442	1.492	1.542	1.592	1.642	1.692	1.742	1.792	1.842	1.892	1.942	1.992	2.042	2.092	2.142	2.192
1.223	1.173	1.123	1.073	1.023	0.973	0.923	0.873	0.823	0.773	0.723	0.673	0.623	0.573	0.523	0.473	0.423
1.154	1.204	1.254	1.304	1.354	1.404	1.454	1.504	1.554	1.604	1.654	1.704	1.754	1.804	1.854	1.904	1.954
1.161	1.111	1.061	1.011	0.961	0.911	0.861	0.811	0.761	0.711	0.661	0.611	0.561	0.511	0.461	0.411	0.361
0.887	0.937	0.987	1.037	1.087	1.137	1.187	1.237	1.287	1.337	1.387	1.437	1.487	1.537	1.587	1.637	1.687
1.435	1.385	1.335	1.285	1.235	1.185	1.135	1.085	1.035	0.985	0.935	0.885	0.835	0.785	0.735	0.685	0.635
1.320	1.370	1.420	1.470	1.520	1.570	1.620	1.670	1.720	1.770	1.820	1.870	1.920	1.970	2.020	2.070	2.120
1.368	1.318	1.268	1.218	1.168	1.118	1.068	1.018	0.968	0.918	0.868	0.818	0.768	0.718	0.668	0.618	0.568
1.188	1.238	1.288	1.338	1.388	1.438	1.488	1.538	1.588	1.638	1.688	1.738	1.788	1.838	1.888	1.938	1.988
0.905	0.855	0.805	0.755	0.705	0.655	0.605	0.555	0.505	0.455	0.405	0.355	0.305	0.255	0.205	0.155	0.105
0.595	0.645	0.695	0.745	0.795	0.845	0.895	0.945	0.995	1.045	1.095	1.145	1.195	1.245	1.295	1.345	1.395
1.410	1.360	1.310	1.260	1.210	1.160	1.110	1.060	1.010	0.960	0.910	0.860	0.810	0.760	0.710	0.660	0.610
1.227	1.277	1.327	1.377	1.427	1.477	1.527	1.577	1.627	1.677	1.727	1.777	1.827	1.877	1.927	1.977	2.027
1.546	1.496	1.446	1.396	1.346	1.296	1.246	1.196	1.146	1.096	1.046	0.996	0.946	0.896	0.846	0.796	0.746
1.234	1.284	1.334	1.384	1.434	1.484	1.534	1.584	1.634	1.684	1.734	1.784	1.834	1.884	1.934	1.984	2.034
1.399	1.349	1.299	1.249	1.199	1.149	1.099	1.049	0.999	0.949	0.899	0.849	0.799	0.749	0.699	0.649	0.599
1.313	1.363	1.413	1.463	1.513	1.563	1.613	1.663	1.713	1.763	1.813	1.863	1.913	1.963	2.013	2.063	2.113
0.991	0.941	0.891	0.841	0.791	0.741	0.691	0.641	0.591	0.541	0.491	0.441	0.391	0.341	0.291	0.241	0.191
0.894	0.944	0.994	1.044	1.094	1.144	1.194	1.244	1.294	1.344	1.394	1.444	1.494	1.544	1.594	1.644	1.694

FIG. 13D

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	Min IA	-.90v	-.85v	-.80v	-.75v	-.70v	-.65v	-.60v	-.55v	-.50v	-.45v	-.40c	-.35v	-.30v	-.25v	-.20v	-.15v	-.10v	-.05v
		=== I data ===		0dB ===		Group 1	Average I Values					### Avgs Scanned in Opposite Sense ###							
Avg 21A	-0.062	1.918 0.064	1.866 0.114	1.816 0.164	1.766 0.214	1.716 0.264	1.666 0.314	1.616 0.364	1.566 0.414	1.516 0.464	1.466 0.514	1.416 0.564	1.366 0.614	1.316 0.664	1.266 0.714	1.216 0.764	1.166 0.814	1.116 0.864	1.066 0.914
		Shift the Min IA Line ** Places to the Left																	
Avg 22A	0.040	0.114 1.960 0.220	0.164 1.910 0.270	0.214 1.860 0.320	0.264 1.810 0.370	0.314 1.760 0.420	0.364 1.710 0.470	0.414 1.660 0.520	0.464 1.610 0.570	0.514 1.560 0.620	0.564 1.510 0.670	0.614 1.460 0.720	0.664 1.410 0.770	0.714 1.360 0.820	0.764 1.310 0.870	0.814 1.260 0.920	0.864 1.210 0.970	0.914 1.160 1.020	0.964 1.110 1.070
		Shift the Min IA Line ** Places to the Right																	
Avg 23A	0.022	0.220 1.875 0.101	0.270 1.825 0.151	0.320 1.775 0.201	0.370 1.725 0.251	0.420 1.675 0.301	0.470 1.625 0.351	0.520 1.575 0.401	0.570 1.525 0.451	0.620 1.475 0.501	0.670 1.425 0.551	0.720 1.375 0.601	0.770 1.325 0.651	0.820 1.275 0.701	0.870 1.225 0.751	0.920 1.175 0.801	0.970 1.125 0.851	1.020 1.075 0.901	1.070 1.025 0.951
		Shift the Min IA Line ** Places to the Height																	
Avg 24A	-0.002	0.101 2.390 0.588	0.151 2.340 0.638	0.201 2.290 0.688	0.251 2.240 0.738	0.301 2.190 0.788	0.351 2.140 0.838	0.401 2.090 0.888	0.451 2.040 0.938	0.501 1.990 0.988	0.551 1.940 1.038	0.601 1.890 1.088	0.651 1.840 1.138	0.701 1.790 1.188	0.751 1.740 1.238	0.801 1.690 1.288	0.851 1.640 1.338	0.901 1.590 1.388	0.951 1.540 1.438
		Shift the Min IA Line ** Places to the Height																	
Avg 25B	0.032	0.588 2.325 0.493	0.638 2.275 0.543	0.688 2.225 0.593	0.738 2.175 0.643	0.788 2.125 0.693	0.838 2.075 0.743	0.888 2.025 0.793	0.938 1.975 0.843	0.988 1.925 0.893	1.038 1.875 0.943	1.088 1.825 0.993	1.138 1.775 1.043	1.188 1.725 1.093	1.238 1.675 1.143	1.288 1.625 1.193	1.338 1.575 1.243	1.388 1.525 1.293	1.438 1.475 1.343
		Shift the Min IA Line ** Places to the Left																	
Avg 26B	-0.169	0.543 1.712 -0.257	0.593 1.662 -0.207	0.643 1.612 -0.157	0.693 1.562 -0.107	0.743 1.512 -0.057	0.793 1.462 -0.007	0.843 1.412 0.043	0.893 1.362 0.093	0.943 1.312 0.143	0.993 1.262 0.193	1.043 1.212 0.243	1.093 1.162 0.293	1.143 1.112 0.343	1.193 1.062 0.393	1.243 1.012 0.443	1.293 0.962 0.493	1.343 0.912 0.543	1.393 0.862 0.593
		Shift the Min IA Line ** Places to the Left																	
Avg 27A	0.120	-0.107 2.149 0.468	-0.057 2.099 0.518	-0.007 2.049 0.568	0.047 1.999 0.618	0.097 1.949 0.668	0.147 1.899 0.718	0.197 1.849 0.768	0.247 1.799 0.818	0.297 1.749 0.868	0.347 1.699 0.918	0.397 1.649 0.968	0.447 1.599 1.018	0.497 1.549 1.068	0.547 1.499 1.118	0.597 1.449 1.168	0.647 1.399 1.218	0.697 1.349 1.268	0.747 1.299 1.318
		Shift the Min IA Line ** Places to the Right																	
Avg 28C	0.178	0.468 2.007 0.385	0.518 1.957 0.435	0.568 1.907 0.485	0.618 1.857 0.535	0.668 1.807 0.585	0.718 1.757 0.635	0.768 1.707 0.685	0.818 1.657 0.735	0.868 1.607 0.785	0.918 1.557 0.835	0.968 1.507 0.885	1.018 1.457 0.935	1.068 1.407 0.985	1.118 1.357 1.035	1.168 1.307 1.085	1.218 1.257 1.135	1.268 1.207 1.185	1.318 1.157 1.235
		Shift the Min IA Line ** Places to the Right																	
Avg 29C	-0.127	0.385 2.471 0.542	0.435 2.421 0.592	0.485 2.371 0.642	0.535 2.321 0.692	0.585 2.171 0.742	0.635 2.121 0.792	0.685 2.071 0.842	0.735 2.021 0.892	0.785 1.971 0.942	0.835 1.921 0.992	0.885 1.871 1.042	0.935 1.821 1.092	0.985 1.771 1.142	1.035 1.721 1.192	1.085 1.671 1.242	1.135 1.621 1.292	1.185 1.571 1.342	1.235 1.521 1.392
		Shift the Min IA Line ** Places to the Left																	
Avg 30B	0.032	0.692 2.073 0.304	0.742 2.023 0.354	0.792 1.973 0.404	0.842 1.923 0.454	0.892 1.873 0.504	0.942 1.823 0.554	0.992 1.773 0.604	1.042 1.723 0.654	1.092 1.673 0.704	1.142 1.623 0.754	1.192 1.573 0.804	1.242 1.523 0.854	1.292 1.473 0.904	1.342 1.423 0.954	1.392 1.373 1.004	1.442 1.323 1.054	1.492 1.273 1.104	1.542 1.223 1.154
		Shift the Min IA Line ** Places to the Right																	
		0.301	0.351	0.401	0.451	0.501	0.551	0.601	0.651	0.701	0.751	0.801	0.851	0.901	0.951	1.001	1.051	1.101	1.151

	Min IA	.0v	.05v	.10v	.15v	.20v	.25v	.30v	.35v	.40v	.45v	.50v	.55v	.60v	.65v	.70v	.75v	.80v	.85v
		=== I data ===		0dB ===		Group 1	Average I Values					### Avgs Scanned in Opposite Sense ###							
Avg 21A	-0.062	1.016 0.964	0.966 1.014	0.916 1.064	0.866 1.114	0.816 1.164	0.766 1.214	0.716 1.264	0.666 1.314	0.616 1.364	0.566 1.414	0.516 1.464	0.466 1.514	0.416 1.564	0.366 1.614	0.316 1.664	0.266 1.714	0.216 1.764	0.166 1.814
		Shift the Min IA Line ** Places to the Left																	
Avg 22A	0.040	1.014 0.960	1.064 0.910	1.114 0.860	1.164 0.810	1.214 0.760	1.264 0.710	1.314 0.660	1.364 0.610	1.414 0.560	1.464 0.510	1.514 0.460	1.564 0.410	1.614 0.360	1.664 0.310	1.714 0.260	1.764 0.210	1.814 0.160	1.864 0.110
		Shift the Min IA Line ** Places to the Right																	
Avg 23A	0.022	1.070 0.975	1.120 0.925	1.170 0.875	1.220 0.825	1.270 0.775	1.320 0.725	1.370 0.675	1.420 0.625	1.470 0.575	1.520 0.525	1.570 0.475	1.620 0.425	1.670 0.375	1.720 0.325	1.770 0.275	1.820 0.225	1.870 0.175	1.920 0.125
		Shift the Min IA Line ** Places to the Height																	
Avg 24A	-0.002	1.001 1.490	1.051 1.440	1.101 1.390	1.151 1.340	1.201 1.290	1.251 1.240	1.301 1.190	1.351 1.140	1.401 1.090	1.451 1.040	1.501 0.990	1.551 0.940	1.601 0.890	1.651 0.840	1.701 0.790	1.751 0.740	1.801 0.690	1.851 0.640
		Shift the Min IA Line ** Places to the Height																	
Avg 25B	0.032	1.488 1.425	1.538 1.375	1.588 1.325	1.638 1.275	1.688 1.225	1.738 1.175	1.788 1.125	1.838 1.075	1.888 1.025	1.938 0.975	1.988 0.925	2.038 0.875	2.088 0.825	2.138 0.775	2.188 0.725	2.238 0.675	2.288 0.625	2.338 0.575
		Shift the Min IA Line ** Places to the Left																	
Avg 26B	-0.169	1.443 0.812	1.493 0.762	1.543 0.712	1.593 0.662	1.643 0.612	1.693 0.562	1.743 0.512	1.793 0.462	1.843 0.412	1.893 0.362	1.943 0.312	1.993 0.262	2.043 0.212	2.093 0.162	2.143 0.112	2.193 0.062	2.243 0.012	2.293 -0.035
		Shift the Min IA Line ** Places to the Left																	
Avg 27A	0.120	0.797 1.247	0.847 1.199	0.897 1.149	0.947 1.099	0.997 1.049	1.047 0.999	1.097 0.949	1.147 0.899	1.197 0.849	1.247 0.799	1.297 0.749	1.347 0.699	1.397 0.649	1.447 0.599	1.497 0.549	1.547 0.499	1.597 0.449	1.647 0.399
		Shift the Min IA Line ** Places to the Right																	
Avg 28C	0.178	1.268 1.107	1.318 1.057	1.368 1.007	1.418 0.957	1.468 0.907	1.518 0.857	1.568 0.807	1.618 0.757	1.668 0.707	1.718 0.657	1.768 0.607	1.818 0.557	1.868 0.507	1.918 0.457	1.968 0.407	2.018 0.357	2.068 0.307	2.118 0.257
		Shift the Min IA Line ** Places to the Right																	
Avg 29C	-0.127	1.285 1.085	1.335 1.135	1.385 1.185	1.435 1.235	1.485 1.285	1.535 1.335	1.585 1.385	1.635 1.435	1.685 1.485	1.735 1.535	1.785 1.585	1.835 1.635	1.885 1.685	1.935 1.735				
		Shift the Min IA Line ** Places to the Right																	
Avg 30B	0.032	1.471 1.442	1.521 1.492	1.571 1.542	1.621 1.592	1.671 1.642	1.721 1.692	1.771 1.742	1.821 1.792	1.871 1.842	1.921 1.892	1.971 1.942	2.021 1.992	2.071 2.042	2.121 2.092	2.171 2.142	2.221 2.192	2.271 2.242	2.321 2.292
		Shift the Min IA Line ** Places to the Left																	
		1.592	1.642	1.692	1.742	1.792	1.842	1.892	1.942	1.992	2.042	2.092	2.142	2.192	2.242	2.292	2.342	2.392	2.442
		1.173 1.224	1.123 1.274	1.073 1.324	1.023 1.374	0.973 1.424	0.923 1.474	0.873 1.524	0.823 1.574	0.773 1.624	0.723 1.674	0.673 1.724	0.623 1.774	0.573 1.824	0.523 1.874	0.473 1.924	0.423 1.974	0.373 2.024	0.323 2.074
		Shift the Min IA Line ** Places to the Right																	
		1.151	1.201	1.251	1.301	1.351	1.401	1.451	1.501	1.551	1.601	1.651	1.701	1.751	1.801	1.851	1.901	1.951	2.001

FIG. 13E

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RANDOM 1 data

Trial Group	Orig Noise Avg	New Noise Average 1	2	3	4	5	Equiv Voltage Added	Last Noise Avg	Ratio Orig Last
205 1	0.1481	0.0686	-0.1814	0.0686	-0.0564	0.0061	-0.1233	-0.0252	5.9
205 2	0.5426	0.3662	0.1162	-0.1338	-0.0088	0.0532	-0.5201	0.0225	-4.1
205 3	0.6213	0.5002	0.2502	0.0002	-0.1248	-0.0623	-0.6524	-0.0311	20.0
206 1	-0.2508	-0.0508	0.1992	-0.0508	0.0942	0.0117	0.2313	-0.0196	12.8
206 2	0.1813	-0.1142	0.1358	-0.1142	0.0108	-0.0517	-0.2017	-0.0205	8.9
206 3	-0.4060	0.3165	-0.0565	0.1835	0.0585	-0.0040	0.4332	0.0272	14.9
207 1	-0.2893	-0.0300	0.2200	-0.0800	0.0950	0.0825	0.2906	0.0013	223.5
207 2	-0.0591	0.1268	-0.1232	0.1266	0.0018	-0.0602	0.0296	-0.0295	2.0
207 3	0.8016	0.7904	0.5404	0.2904	0.1654	0.1029	-0.7300	0.0716	11.2
208 1	-0.3269	-0.1255	0.1245	-0.1255	-0.0005	0.0620	0.3577	0.0308	10.6
208 2	-0.5892	-0.4528	-0.2026	0.0472	-0.0778	-0.0153	0.6052	0.0160	36.9
208 3	-0.5162	-0.3509	-0.1009	0.1491	0.0241	-0.0884	0.5090	-0.0071	72.4
209 1	-0.3328	-0.2315	0.0185	-0.2315	-0.1065	-0.0440	0.8200	-0.0128	26.1
209 2	0.7883	0.6286	0.3786	0.1286	0.0036	-0.0589	-0.8160	-0.0277	28.5
209 3	-0.3146	-0.1996	0.0504	-0.1996	-0.0746	-0.0121	0.3338	0.0192	16.4
210 1	-0.4353	-0.2432	0.0066	-0.2432	-0.1182	-0.0557	0.4109	-0.0244	17.8
210 2	-0.1066	0.1332	-0.1168	0.1332	0.0082	-0.0543	0.0836	-0.0230	4.8
210 3	0.2597	0.0257	-0.2246	0.0257	-0.0993	-0.0366	-0.2652	-0.0055	46.9
211 1	-0.2477	-0.0226	0.2280	-0.0220	0.1030	0.0405	0.2569	0.0093	26.7
211 2	-0.2277	-0.2138	0.0362	-0.2138	-0.0888	-0.0263	0.2827	0.0049	-46.0
211 3	0.6775	0.5916	0.3446	0.0948	-0.0304	0.0321	-0.6767	0.0008	820.7
212 1	0.1145	-0.2323	0.0122	-0.2323	-0.1073	-0.0446	-0.1280	-0.0138	8.4
212 2	0.3209	0.2503	0.0003	-0.2497	-0.1247	-0.0622	-0.3518	-0.0309	10.4
212 3	0.2695	0.2159	-0.0341	0.2159	0.0909	0.0284	-0.2624	-0.0029	90.1
213 1	0.4217	0.2221	-0.0279	0.2221	0.0971	0.0846	0.4183	0.0034	123.8
213 2	-0.5357	-0.3012	-0.0512	0.1988	0.0738	0.0116	0.5167	-0.0199	26.9
213 3	-0.2945	-0.2948	-0.0248	0.2232	0.1002	0.0557	0.3008	0.0065	48.8
214 1	-0.6983	-0.5029	-0.2529	-0.0029	0.1221	0.0596	0.7267	0.0288	24.6
214 2	07664	0.7016	0.4516	0.2016	0.0766	0.0141	-0.7836	-0.0171	44.9
214 3	0.3609	0.2281	-0.0219	0.2281	0.1031	0.0406	-0.3516	0.0098	38.9
215 1	-0.5990	-0.3920	-0.1420	0.1080	-0.0170	0.0455	0.6132	0.0142	42.1
215 2	-0.6418	-0.6169	-0.3669	-0.1169	0.0081	-0.0544	0.6187	-0.0231	27.8
215 3	-0.2020	-0.0166	0.2334	-0.0166	0.1084	0.0459	0.2166	0.0146	13.8
216 1	0.2267	-0.0009	0.2491	-0.0009	0.1241	0.0616	-0.1964	0.0303	7.5
216 2	-0.7869	-0.7607	-0.5107	-0.2607	-0.1357	-0.0732	0.9450	-0.0419	18.8
216 3	-0.3518	-0.0994	0.1506	-0.0994	0.0256	-0.0369	0.3462	-0.0057	61.9
217 1	-0.3168	-0.0968	0.1532	-0.0968	0.0282	-0.0343	0.3138	-0.0031	103.9
217 2	0.3848	0.3126	0.0626	-0.1874	-0.0624	0.0001	-0.4160	-0.0312	12.3
217 3	0.3492	0.2517	0.0017	-0.2483	-0.1233	-0.0608	-0.3788	-0.0296	11.8
218 1	0.2194	0.0254	-0.2246	0.0254	-0.0996	-0.0371	-0.2253	-0.0059	37.2
218 2	-0.6434	-0.5998	-0.3498	-0.0998	0.0252	-0.0373	0.6393	-0.0061	106.0
218 3	0.2516	0.1355	-0.1145	0.1855	0.0105	-0.0520	-0.2724	-0.0207	12.1
219 1	-0.8197	-0.5113	-0.2613	-0.0113	0.1139	0.0612	0.8396	0.0200	41.1
219 2	-0.1859	0.0141	-0.2359	0.0141	-0.1109	-0.0484	0.1688	-0.0172	10.8
219 3	-0.2779	-0.1231	0.1269	-0.1231	0.0019	-0.0608	0.2486	-0.0294	9.5
220 1	-0.2296	-0.0756	0.1944	-0.0956	0.0494	-0.0181	0.2477	0.0181	-12.7
220 2	-0.2729	-0.1909	0.0991	-0.1909	-0.0439	0.0186	0.2582	-0.0146	18.6
220 3	-0.0854	-0.0404	0.2098	-0.0404	0.0848	0.0221	0.0963	-0.0091	9.4
221 1	-0.3921	-0.2118	0.0882	-0.2118	-0.0883	-0.0248	0.3990	0.0069	58.8
221 2	0.8987	0.7852	0.8852	0.2852	0.1602	0.0423	-0.8323	0.0664	13.8
221 3	-0.3528	-0.3370	0.0870	0.1680	0.0880	-0.0243	0.8556	0.0068	52.0

FIG. 14A

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RANDOM Q data

Trial Group	Orig Noise Avg	New Noise Average 1	2	3	4	5	Equiv Voltage Added	Last Noise Avg	Ratio Orig Last
205 1	0.4440	0.3970	0.1470	-0.1030	0.0220	-0.0405	-0.4532	-0.0092	48.1
205 2	0.1928	0.0077	-0.2423	0.0077	-0.1173	-0.0548	-0.2163	-0.0235	8.2
205 3	0.2307	0.0307	-0.2198	0.0507	-0.0943	-0.0318	-0.2313	-0.0006	392.9
206 1	0.6667	0.5649	0.3149	0.0649	-0.0601	0.0024	-0.6955	-0.0288	23.1
206 2	-0.0969	0.1153	-0.1347	0.1158	-0.0097	0.0528	0.1174	0.0215	4.5
206 3	0.0218	-0.2565	-0.0065	0.2435	0.1185	0.0560	0.0030	0.0248	0.9
207 1	0.7412	0.7194	0.4694	0.2194	0.0944	0.0319	-0.7406	0.0006	1181.1
207 2	-0.2973	-0.2522	-0.0022	0.2478	0.1228	0.0603	0.3263	0.0290	10.2
207 3	0.3831	-0.0517	0.1983	-0.0517	0.0733	0.0108	-0.4036	-0.0205	18.7
208 1	0.2199	0.1728	-0.0772	0.1728	0.0478	-0.0147	-0.2033	0.0166	13.3
208 2	0.4198	0.3966	0.1466	-0.1034	0.0216	-0.0409	-0.4295	-0.0097	43.4
208 3	-0.1523	-0.0900	0.1600	-0.0900	0.0350	-0.0275	0.1561	0.0038	40.1
209 1	-0.3033	-0.2685	-0.0185	0.2315	0.1065	0.0440	0.3161	0.0127	23.8
209 2	-0.0808	0.0528	-0.1972	0.0528	-0.0722	-0.0097	0.1024	0.0216	3.7
209 3	-0.0148	0.1385	-0.1115	0.1385	0.0135	-0.0490	-0.0029	-0.0177	0.8
210 1	0.2507	0.1607	-0.0893	0.1607	0.0357	-0.0268	-0.2462	0.0044	56.8
210 2	0.2427	0.2049	-0.0451	0.2049	0.0799	0.0174	-0.2566	-0.0139	17.5
210 3	0.0961	-0.0761	0.1739	-0.0761	0.0489	-0.0136	-0.0784	0.0177	5.4
211 1	0.2869	0.2232	-0.0268	0.2232	0.0982	0.0357	-0.2325	0.0044	53.5
211 2	0.4865	0.2534	0.0034	-0.2456	-0.1216	-0.0591	-0.5143	-0.0278	17.5
211 3	-0.7412	-0.7089	-0.4589	-0.2039	-0.0789	-0.0164	0.7560	0.0148	50.1
212 1	0.5285	0.3926	0.1426	-0.1074	0.0176	-0.0449	-0.5421	-0.0136	38.8
212 2	0.1817	0.0830	-0.1679	0.0830	-0.0420	0.0205	-0.1925	-0.0107	16.9
212 3	-0.0208	0.1420	-0.1080	0.1420	0.0170	-0.0455	0.0066	-0.0142	1.5
213 1	-0.2570	-0.1652	0.0848	-0.1652	-0.0402	0.0223	0.2480	-0.0090	28.7
213 2	-0.0064	0.0310	-0.2190	0.0310	-0.0940	-0.0315	0.0062	-0.0003	24.3
213 3	-0.5096	-0.3200	-0.0700	0.1800	0.0550	-0.0075	0.5333	0.0237	21.5
214 1	-0.0246	0.1703	-0.0797	0.1703	0.0453	-0.0172	0.0387	0.0141	1.8
214 2	-0.1596	-0.0912	0.1586	-0.0912	0.0338	-0.0287	0.1620	0.0025	62.8
214 3	0.1216	-0.0494	0.2006	-0.0494	0.0756	0.0131	-0.1398	-0.0181	6.7
215 1	-0.3403	-0.0218	0.2287	-0.0213	0.1037	0.0412	0.3502	0.0099	34.3
215 2	-0.1557	-0.0243	0.2257	-0.0243	0.1007	0.0382	0.1627	0.0069	22.4
215 3	-0.5943	-0.3037	-0.0537	0.1963	0.0713	0.0088	0.5718	-0.0225	26.5
216 1	0.1581	0.0282	-0.2218	0.0282	-0.0968	-0.0343	-0.1614	-0.0030	52.0
216 2	0.3981	0.3794	0.1294	-0.1206	0.0044	-0.0581	-0.4250	-0.0268	14.8
216 3	0.1159	-0.0841	0.1659	-0.0841	0.0409	-0.0216	-0.1063	0.0097	12.0
217 1	0.4497	0.2497	-0.0003	0.2497	0.1247	0.0622	-0.4188	0.0309	14.5
217 2	0.5273	0.2169	-0.0331	0.2169	0.0919	0.0294	-0.5292	-0.0019	278.7
217 3	0.1066	-0.0700	0.1800	-0.0700	0.0550	-0.0075	-0.0829	0.0238	4.5
218 1	-0.4485	-0.2822	-0.0322	0.2178	0.0928	0.0303	0.4475	-0.0010	453.7
218 2	0.0983	-0.1447	0.1058	-0.1447	-0.0197	0.0428	-0.0867	0.0115	8.5
218 3	0.0171	-0.1190	0.1310	-0.1190	0.0060	-0.0565	-0.0423	-0.0252	0.7
219 1	0.0508	-0.1111	0.1389	-0.1111	0.0139	-0.0486	-0.0681	-0.0173	2.9
219 2	0.2668	0.0668	-0.1882	0.0668	-0.0582	0.0043	-0.2938	-0.0270	9.9
219 3	-0.2792	-0.1891	0.0609	-0.1891	-0.0641	-0.0016	0.3088	0.0296	9.4
220 1	0.6507	0.6095	0.3595	0.1095	-0.0155	0.0470	-0.6349	0.0158	41.2
220 2	0.6336	0.3617	0.1112	-0.1383	-0.0133	0.0492	-0.6157	0.0179	35.4
220 3	-0.1340	0.1748	-0.0752	0.1748	0.0498	-0.0127	0.1525	0.0185	7.2
221 1	-0.3141	-0.1141	0.1359	-0.1141	0.0109	-0.0516	0.2938	-0.0204	15.4
221 2	-0.0350	0.1447	-0.1056	0.1447	0.0197	-0.0428	0.0235	-0.0116	3.0
221 3	0.1035	-0.1367	0.1144	-0.1367	0.0117	0.0508	-0.0839	0.0196	5.3

FIG. 14B

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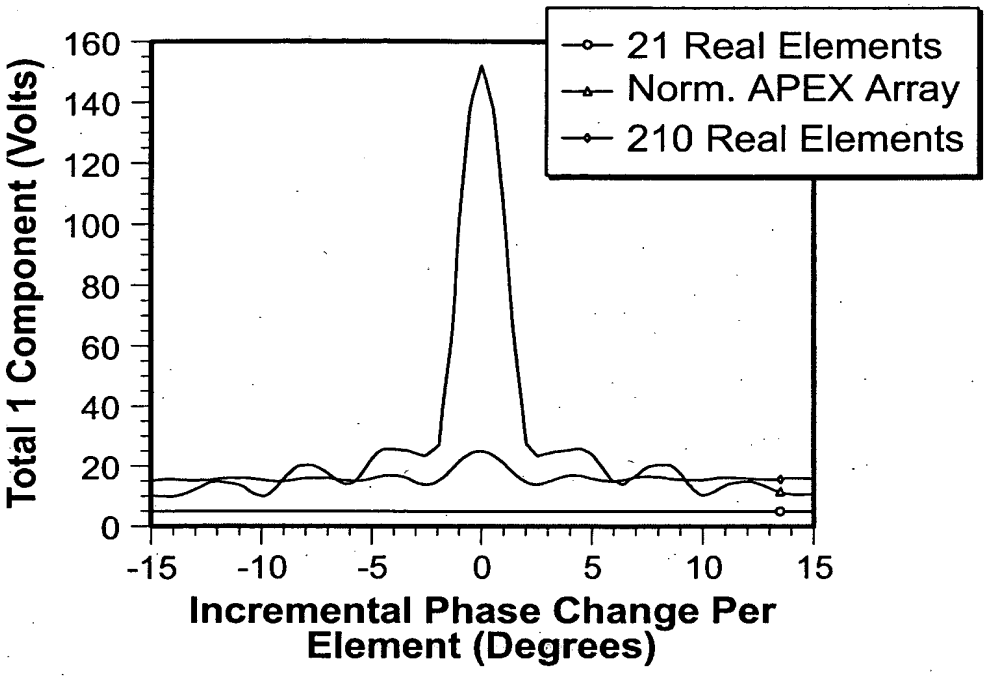

FIG. 15A

Illustration of Comparative Improvement

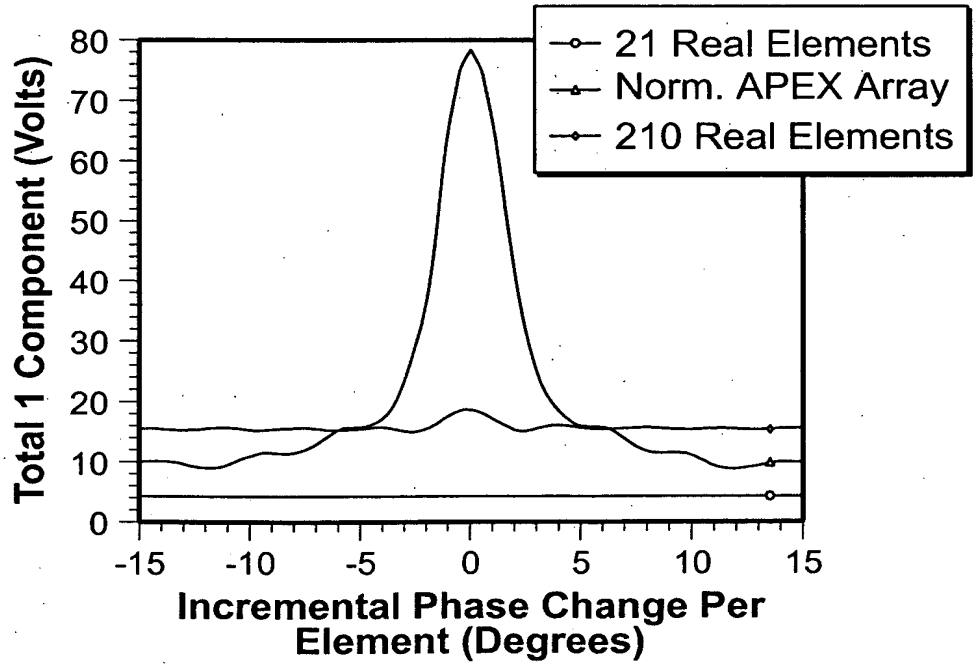

FIG. 15B

OIPE
APR 18 2005
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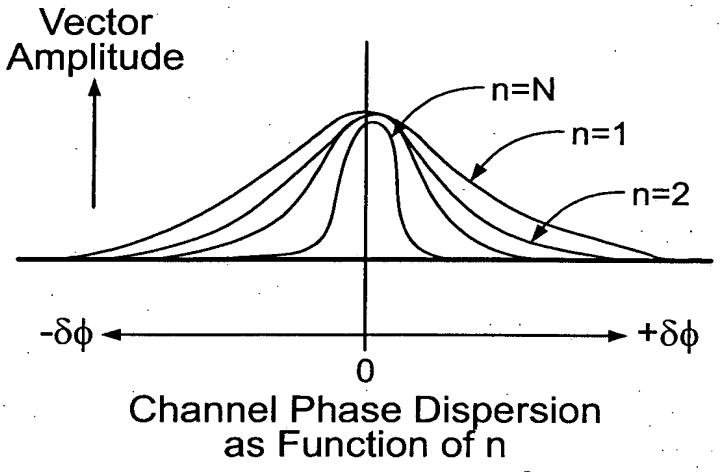

FIG. 16A

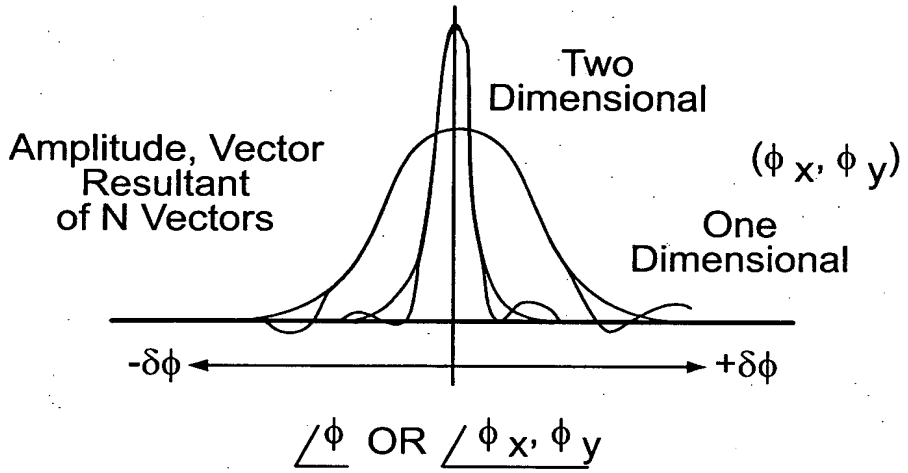

FIG. 16B

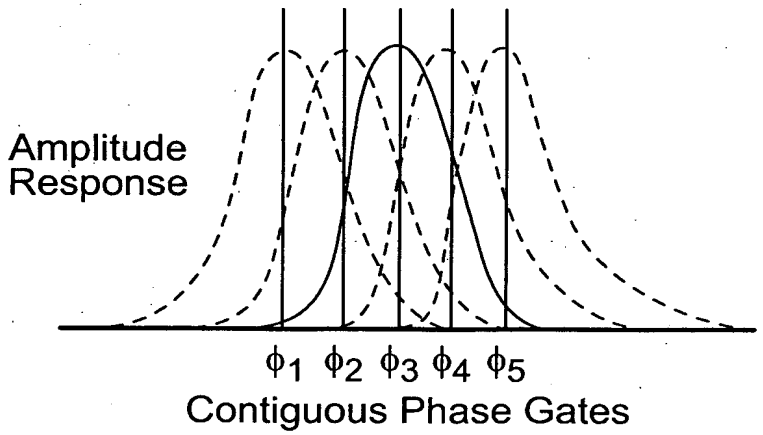

FIG. 16C